

VÍT BUBENÍK

The Phonological Interpretation
of Ancient Greek:
A Pandialectal Analysis



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THE PHONOLOGICAL INTERPRETATION OF ANCIENT GREEK

This volume treats systematically the variation found in the successive stages of the development of all ancient Greek dialects. It combines a synchronic approach, in which generative rules expound phonological divergencies between the systems of different dialects, with a diachronic statement of unproductive and mostly pan-Hellenic shifts.

Professor Bubeník presents a phonetic description and structural phonemic analysis of the best-known variant - Classical Attic of the 5th century B.C. - and displays and contrasts the vocalic and consonantal inventories of all the other dialects classified according to their major groups. Derivational histories of individual dialects are examined in their juxtaposition, to ascertain which rules are shared by various dialects and which are dialect-specific. The pan-dialectal framework enables Bubeník to capture various relationships among genetically related dialects which are missed in atomistic and static treatments, and to show more convincingly the extent of their similarity and their systemic cohesion.

This volume makes a significant contribution to both classical scholarship and current theory of language change by offering new analyses of a variety of phonological and morpho-phonemic problems presented by a dead language and its dialects.

VÍT BUBENÍK is a member of the Department of Linguistics at Memorial University.

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To the memory of my father

OLDŘICH BUBENÍK (1908–1973)

who was my first teacher of Ancient Greek

φύλλα τὰ μὲν τ' ἄνεμος χαμάδις χέει, ἄλλα δέ θ' ὕλη
τηλεθόωσα φύει, ἔαρος δ' ἐπιγίγνεται ὥρη

ΙΛΙΑΔΟΣ Ζ, 147-8

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PREFACE

This book is based on my research in the area of Ancient Greek dialects and Mycenology going back to 1966. Its subject has been treated by many classical scholars for several generations. However, in recent years more up-to-date linguistic methods have been applied consistently in this area. It is no exaggeration to claim that Ancient Greek represents one of the most interesting and challenging fields among extinct Indo-European languages for both the diversity and the multiplicity of its dialects and its time depth. The fact that the subject of the variation in a language like Greek is far from being exhausted was one of the main impulses which directed my research. Furthermore I believe that an understanding of regional variation in the dead language has a great relevance for the study of the same phenomenon in its living descendant. Greek will undoubtedly continue to be one of the most rewarding areas of study of linguistic change.

I must gratefully acknowledge the advice and assistance of Dr. A. Bartoněk in the initial stages of my work. He was my supervisor in the years when I was working on my doctoral dissertation 'Pádová syntax mykénského dialektu' (The Syntax of Case in Mycenaean Greek), which I submitted to the Faculty of Arts, University J.E. Purkyně in Brno, in 1969. I benefited enormously from his profound knowledge of Ancient Greek dialects and his linguistic insights. I wish to thank Dr. A. Erhart, who taught me general and historical linguistics. Next I must thank the Department of Classics and University J.E. Purkyně for allowing me to spend five months in Greece, where I could pursue my study of dialect inscriptions.

After I had moved to Canada I had the opportunity to discuss various problems of Ancient and Modern Greek phonology and phonological theory in general with Professor W.S. Allen

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(University of Cambridge), Dr. J. Hewson (Memorial University), Professor F.W. Householder (Indiana University), Dr. B. Newton (Simon Fraser University), Dr. I. Warburton (University of Reading) and Dr. L. Zgusta (University of Illinois). All these scholars made valuable comments and suggestions on earlier drafts of my work.

My colleagues at Memorial University Dr. S. Clarke, Mr. L. Smith and Mr. B. O'Dwyer proofread various parts of the manuscript and provided invaluable assistance in the matter of style. I am especially grateful to Dr. J. Hewson who read the whole manuscript and saved me from a number of unhappy statements. It is hardly necessary to say that none of these people is in any way responsible for any shortcomings or errors in my work; these remain solely my responsibility.

St. John's
August 31, 1976

I am also indebted to two anonymous readers of the University of Toronto Press for their candid suggestions on my presentation of certain problems in phonology and morphophonemics, and for sharpening my perception of some theoretical issues.

And finally, it is my pleasant duty to acknowledge the generous support of Memorial University of Newfoundland which helped me by two Vice-President's Research Grants to offset the typing and publishing costs connected with the production of this manuscript.

St. John's
August 31, 1981

Vít Bubeník

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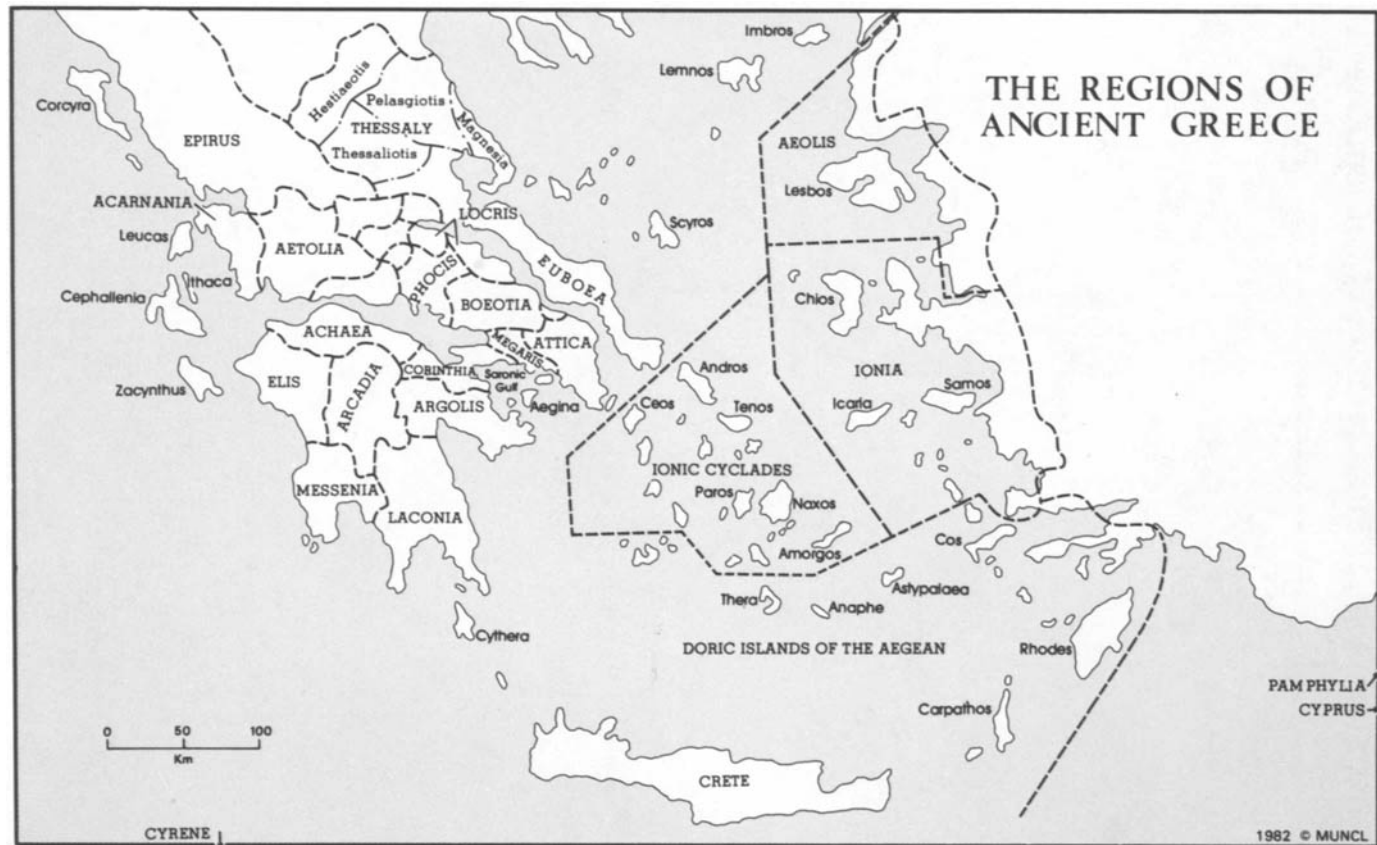
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The Phonological Interpretation of Ancient Greek



Introduction

1.1 AIMS

The aim of the present monograph is a systematic presentation of the most likely historical processes that are responsible for the variation found in successive stages of the development of the major dialectal groups of Ancient Greek. I will be interested in accounting for the changes that have affected the sound structure of Ancient Greek dialects over the period of approximately one thousand years in all areas where Greek was spoken. Generally speaking I will attempt to explain the variation in Ancient Greek as

(a) a function of the *time* dimension

Mycenaean (1400 - 1100)

post-Mycenaean (1100 - 700)

Classical (700 - 350)

Hellenistic (350 - 150)

Graeco-Roman (150 B.C. - 300 A.D.)

(b) a function of the *space* dimension.

The geographical area where the Ancient Greek dialects were spoken (the southern part of the Balkan peninsula, the adjacent islands and a part of the land mass of Asia Minor) may be surveyed on map 1-1. The dialects of overseas settlements (Corcyra, Italy, Sicily, Hellespont, Euxine, etc.) will be excluded from my discussion (or used only as evidence for the dialect of a particular metropolis).

The documentary evidence is rich but uneven and with considerable gaps. The primary documents are represented by the corpus of the Greek alphabetic inscriptions (from the end of the 8th c. down to the Christian Era) and the corpus of Linear B tablets (from the 14th to the 12th c.). Our primary documents can in no way be compared as to reliability and extent with materials which are at the disposal of

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students of living dialects. The limitations under which the dialectology of a dead language labours are well-known. First of all, where the students of living dialects are dealing with the phonetic reality elicited from speakers of particular dialects, historical dialectology can only interpret written documents, a technique which is attended with various difficulties. The spelling itself is merely a graphic representation of the phonetic reality. This becomes especially obvious when it comes to such important matters as accent or external sandhi, where the written documents are really 'dumb'. For instance, given our knowledge of the Attic accent system and our rudimentary knowledge of the Doric accent system we may wonder about the placing of the accent in the Hellenistic Greek spoken in the Peloponnese or elsewhere in the old Doric areas:

Attic αἱ γυναῖκες ἔλαβον 'the women took'

Doric αἱ γυναῖκες ἐλάβον

Hellenistic αἱ γυναῖκες ἐλάβοσαν

We may hypothesize that there were speakers of Hellenistic Greek who would stress γυναῖκες in the Doric way by placing the acute on the penult. Such a hypothesis is obviously hard to verify unless we find a phonetic description of the case by an ancient grammarian or, what is more difficult, unless we discover a parallel in Modern Greek dialects, which will necessarily remain of doubtful value.

In the second place, linguists have to keep in mind that writing systems are conservative and that graphemic change lags behind phonetic change. This is a commonplace in all languages and again it is quite easily demonstrable in living languages. However, in our case it is sometimes quite difficult to know whether a particular inscription shows predominantly historical spellings or phonetic spellings, a distinction which of course has considerable consequences for the relative chronology of sound change. Particularly the disappearance of some dialectal phenomenon from the inscriptions of a certain community during several generations need not imply the fact that this phenomenon disappeared also from the *colloquial usage* of the dialect. What is sometimes a quite likely explanation is that the phenomenon disappeared from the *literary usage* of the dialect, i.e., the scribes (as in the later inscriptions from the time of the Attic Koine) realized that this phenomenon was simply a kind of 'provincialism' which was to be avoided for various reasons. Unfortunately, we are not always in a position to prefer one of the above solutions.

As Nagy-Householder (1972:36) put it: 'in fact, we may posit as a general principle that the constraints and licences of the various Greek orthographic systems are the primary key

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to evaluating the nuances of the underlying phonological systems.' Quite often, however, the value of this primary principle is substantially lessened by various caprices of ancient scribes.

If we find late spellings ἐκγδοθη or ἐκγ βασιλέως (instead of etymological ἐκδοθη, ἐκ βασιλέως), we certainly can make a case for phonetic spelling, which attempts to capture a phonetic reality [egdot^hē]. The voiced [g] is here a result of the natural voicing of a voiceless stop before a voiced one. However, what are we to think about spellings like ἐκγ πόλεως where voicing is out of question?

In spite of these difficulties the genuine task of historical dialectology should be a reconstruction of the most likely sequence of historical linguistic events which entail an internal dialectal differentiation of the language (and of course even internal differentiation of the main dialectal groups and individual dialects) at any stage of its history. In accordance with this basic tenet my principal aim should be to 'explain' the interdialectal variation at several historical stages before the Classical Era, and likewise the usage of the Classical and post-Classical Era itself.

In the case of a living language, the prerequisite of any phonological interpretation is a reliable phonetic description' (In the case of a dead language, the phonetic 'description' (the reliability of which falls far short of the reliability of the phonetic description of any living language) should rather be called phonetic 'reconstruction'.

Phonetic reconstruction of Ancient Greek was a preoccupation of several generations of classical philologists culminating in Sturtevant (1940) and Grammont (1948). W.S. Allen, *Vox Graeca* (1968, 1974) supersedes all the previous accounts by being a thorough synchronic treatment which brings into discussion many valuable parallels from dead and modern languages. The dialect analyzed is fifth-century Attic, but there are also diachronic considerations regarding earlier and later stages and references to other dialects. The book contains also a revised description of the Greek tonal accent and stress.

Nowadays it is no exaggeration to claim that we have a sufficiently exact idea of how Classical Attic was pronounced, even if there are still some details which are disputable. The principal techniques employed in phonetic reconstruction were also refined. They are based on the interpretation of the following types of data, according to Allen (1974:vii):

- 1) statements by contemporary grammarians and other writers
- 2) word-play, contemporary etymologies, and onomatopoeia
- 3) representations in other ancient languages
- 4) subsequent developments

5) spelling conventions and variants

6) the internal structure of the language itself.

The points 3) and 4) represent external evidence (in space and time); the rest can be called internal evidence. The interpretation of representations in other ancient languages is attended with particular difficulties, and it is hard to know sometimes whether we are dealing with phonetic transcriptions or with simple transliterations.

1.2 GENERAL APPROACH

Dialects arise because some sound changes fail to diffuse over a whole speech community; the ultimate causes of this phenomenon are of course extralinguistic. Thus e.g., Ionic fronting process $\bar{a} \rightarrow \bar{e}$ failed to diffuse through Attic territory and we can talk about an incomplete sound change: Attic $\chi\acute{\omega}\rho\alpha$ 'land' versus Ionic $\chi\acute{\omega}\rho\eta$. In this way arise differences in patterns of alternation e.g., the Proto-Greek intervocalic consonantal cluster $*sm$ was subject to the regressive assimilation of sibilant $*sm \rightarrow mn$ only in the Aeolic dialectal group. In all other dialects fricative weakening $s \rightarrow h$ (with subsequent loss of voiceless breathing and compensatory lengthening) took place: Attic $\epsilon\lambda\mu\acute{\iota}$ 'I am' versus Lesbian $\epsilon\lambda\mu\mu$. The ultimate causes of this 'choice' of two different directions (= diachronic split) have to do with spatial and temporal separation of speakers of Proto-Ionic and Proto-Aeolic.

A description of interdialectal variations among Ancient Greek dialects in terms of the sequence of actual events is formalizable, if each change is labeled a 'rule'. The sequential character of historical sound-changes will then be represented by the formal descriptive device of linear rule ordering. From the point of view of historical linguistics, the concept of a rule is important not because it 'explains' various alternations, but because a particular change has not taken place in all dialects (= a rule did not apply in all dialects, in other terminology). In this sense then we can account for various alternations observable in individual dialectal groups or dialects. *Stricto sensu*, rules do not have any explanatory power, since they are simply descriptive devices, (they permit a certain economy and elegance of statement; they are easy to survey, etc.); sequences of rules simply give a mechanism for description, not for a historical explanation. So, in the following, by establishing the rules which account for dialectal variations I will mean the specification of the geographical distribution of sound-changes.

Linguists usually try to explain the astonishing variety of phonetic and phonological differences in related dialects

(or genetically related languages) by reducing them, as much as is possible and reasonable. The formal device of this reductionism is a *protoform* (in diachronic linguistics) or *underlying form* (in synchronic linguistics). In the last two decades, a considerable effort has been exerted on the solution of the problem of multiplicity of surface forms. Thus orthodox generativists will claim that all dialects of a single language have identical underlying representations. According to many linguists this view represents a reasonable hypothesis, since it can explain interdialectal communication. To be sure, the fact of the mutual comprehension alone is not considered by many others as a sufficient argument to allow the linguist to set up identical underlying representations. The reasons are obvious: where does mutual comprehension start and where does it end? There are mutually incomprehensible dialects and, on the other hand, mutually comprehensible languages.

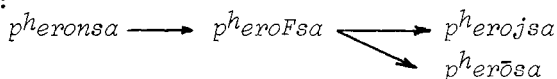
We may start with the examination of some data from several dialects at the time of about 350 B.C.:

	'carrying' (Part Fem)	'of the horse' (Gen Sg)	'two horses' (Dual)
<u>Attic</u>	φέρουσα /p ^h erūsa/	ἵππου /hippū/	ἵππῳ /hippō/
<u>Corinthian</u>	φερουσα /p ^h erōsa/	ἵππου /hippō/	ἵππῳ /hippō/
<u>Laconian</u>	φερωθα /p ^h erōha/	ἵππῳ /hippō/	ἵππῳ /hippō/
<u>Theran</u>	φερωσα /p ^h erōsa/	ἵππου /hippō/	ἵππῳ /hippō/
<u>Lesbian</u>	φέροισα /p ^h eroisa/	ἵππῳ /ippō/	ἵππῳ /ippō/
<u>Central Cretan</u>	φερονσα /p ^h eronsa/	ἵππῳ /hippō/	ἵππῳ /hippō/
<u>West Argolic</u>	φερονσα /p ^h eronsa/	ἵππου /hippō/	ἵππῳ /hippō/

What kind of explanation can we offer for all those different forms of feminine participle 'carrying'? We may recapitulate the traditional explanation offered by historical phonetics preferring to work 'downstream' from the proto-form established on the basis of (external) comparative evidence (e.g., Cretan φερουσα, Lesbian φέροισα, Sanskrit *bharatī* and Avestan *barantī* suffice to establish both Proto-Indoeuropean **bherontjə* and Proto-Greek **p^herontjə*). Then we have to

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assume that later on /t/ before a palatal glide, was palatalized and affricated, yielding something like *p^heront's'ja* [p^heronča]. Subsequently the affricate was fricated and depalatalized resulting in historically documented *p^heronsa*. Later on, according to Lejeune (1972:129), the nasal lost its closure and yielded a voiced fricative, which was unstable and changed into a palatal glide. In Lesbian /j/ formed a diphthong with the preceding vowel; in other dialects, the voiced fricative lost its articulation completely and prolonged with its glottal vibrations the preceding vowel. Thus according to Lejeune we are dealing with a diachronic split:



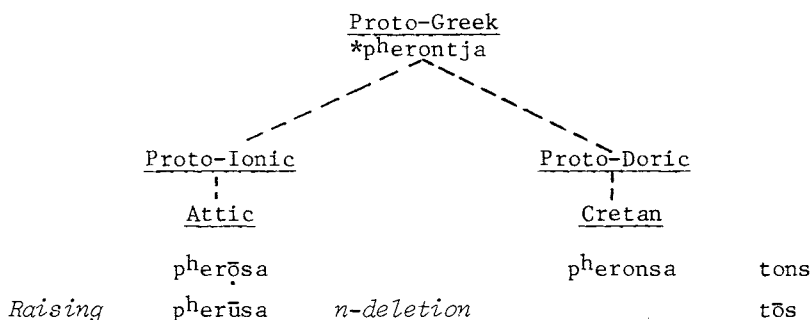
Or we may prefer to work 'upstream' from the data of individual dialects back to the proto-form. Attic, Corinthian and Laconian forms are apparently easy to explain. What is responsible for the differences may be labelled the *raising* of long mid vowel $\bar{o} \rightarrow \bar{ō} \rightarrow \bar{u}$ (as in Early Modern English /stōn/ 'stone' goes back to the Middle English /stōn/ and /mūn/ 'moon' to /mōn/). If we assume that *p^heronsa* underlies these three forms, we have to postulate a phonological process, by which the nasal was lost before a sibilant (this process is responsible for the difference between other dialects and the dialects spoken in Crete and Argolis, where -ns- is preserved). Even this form would not be 'deep' enough since it would not explain alternations like *p^heront + os* (Gen Sg Masc) or the Lesbian form *p^heroisa*. Taking into account these forms we would arrive at **p^herontja* as the form which 'underlies' all the forms in dialects. Without going into any further details, comparative reconstruction of Proto-Greek on the basis of individual dialects could be formalized by linearly ordered 'rules' as below:

	-ontja		
Affrication	-ontsja		
t → ∅	-onsja		
Depalatalization	-onsa	<u>Central Cretan, West Argolic</u>	Metathesis of glide -oinsa
n → ∅ (+ Lengthening)	-ōsa	<u>Theran</u>	-oisa <u>Lesbian</u>
Raising	-ōsa	<u>Corinthian</u>	
Raising	-ūsa	<u>Attic</u>	

It goes without saying that a derivational sequence of this kind does not represent anything like a synchronic process of individual dialects, which explains why these dialects are mutually comprehensible. This sequence is *diachronic* not synchronic. In other words, by this scheme I do not mean that speakers of Cretan were deriving their form *pherōsa* from underlying **pherontja* by applying rules of *affrication*, *t-deletion* and *depalatalization*; that speakers of Attic were doing the same and in addition were applying further rules of *n-deletion* and two *raisings* to generate their *pherūsa*. This kind of 'synchronic' analysis would only repeat the historical events, which actually took place in these dialects over a period of centuries (and many of these changes were shared by various dialects). All I intend to do with similarly specified derivational histories is to formalize my descriptions of the sound-changes taking place in time. By such a presentation I hope to achieve a greater degree of explicitness and more systematic presentation of such sound-changes than are to be found in various works on historical phonetics of Ancient Greek.

This is not to say that synchronic processes in various dialects (especially in those subject to rapid change) did not repeat parts of this diachronic derivational scheme. Thus in Attic the raising process $\bar{o} \rightarrow \bar{u}$ appears to have been a synchronic rule in the 4th c., i.e., speakers of Attic could notice at a certain time that their fathers said /pherōsa/ (they contrasted /pherōsa/ and /t^hūmos/ θυμός) but their own pronunciation was /pherūsa/ (with a contrast /pherūsa/ and /t^hūmos/). Consequently, for one generation we may suppose *pherōsa* as an underlying form of *pherūsa*. Or in Central Cretan the loss of a nasal before a sibilant was certainly at one time a synchronic rule. In this dialect the final cluster *-ns* was preserved before a vowel but *-n-* was lost if the following word began with a consonant, e.g. τούς ἐλευθεροὺς tons + V
but τὸς καδεστὰς tons + C $\longrightarrow$ tos + C
Consequently, we are justified in postulating a synchronic rule of nasal-deletion for Central Cretan in the 5-4th c.

Quite often it is extremely difficult to keep apart descriptions of diachronic changes and synchronic processes. This is true a fortiori for dead dialects, where we have to specify the synchronic cut. Analyzing Greek dialects synchronically around 400 B.C. we may attempt to represent the relationship between historical sound-changes and synchronic processes in the following diagram where the dotted lines represent diachronic events, which took place during roughly a thousand years and are irrelevant synchronically:



It is hard to imagine that the subconscious knowledge of the speakers of individual Greek dialects included something like the whole schema on page 8. Even if morphophonemic analysis of Ancient Greek qua language needs underlying representations like **pherontja*, it still does not mean that speakers of individual dialects of Ancient Greek generated their forms in such or a similar way. This schema is only our description of diachronic changes not a generative model for speakers. We may add that even the communication between two regional variants (e.g., between Attic and Cretan) does not mean that the speakers establish a common set of underlying representations. As is observable daily in connection with any living language, it simply means that both sides build certain dialectal correspondences in their grammars (sometimes called diaphonemes). Some linguists prefer a common diasystem for all the dialects but the point remains that the psychologically real substance for speakers are those sets of correspondences. An Athenian visitor to the Central Crete or the island of Lesbos in the 4th c. B.C. could simply become 'aware' that /ō/ and /ū/ in his dialect correspond to a single /ō/ in the speech of Cretans or Lesbians.

On the other hand, it is easy to show the structural parallelism between morphophonemic and pandialectal analysis and to demonstrate that these two methods are essentially complementary. To take a simple example from Attic, we may formalize the morphophonemic alternation of the type *ag + ō* 'I lead' ~ *ēg + on* (Imperfect) by deriving the Imperfect from underlying *e + agon* by the Augmentation and Low Vowel Rule and the alternation *phainō* 'I reveal' ~ *ēphēna* (Aorist) from underlying *ēphansa* by the Resonant Aorist Rule (according to Sommerstein (1973:25, 51, 62)):

	e + agon		ēp ^h ansa
Augmentation	āgon	Resonant Aorist Rule	ēphāna
Low Vowel Rule	ēgon		ēphēna

11 Introduction

This synchronic sequence will appear as identical with the diachronic sequence which is establishable by means of pan-dialectal analysis: Doric *stālā*, Aeolic *stallā*, Attic *stēlē* (< Proto-Greek **stalnā*); Doric *éphāna* 'I revealed', Attic *éphēna* (< Proto-Greek **éphansa*):

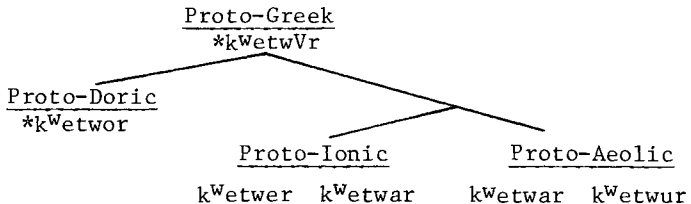
	<i>stalnā</i>	<i>éphansa</i>	
<i>Lengthening</i>	<i>stālā</i>	<i>éphāna</i>	<u>Doric</u>
<i>Fronting</i>	<i>stālæ</i>	<i>éphæna</i>	
<i>Raising</i>	<i>stēlē</i>	<i>éphēna</i>	<u>Attic</u>

It is precisely here where linguists disagree - some accept all the units given by the morphophonemic analysis as synchronic entities, some try to give to these units different temporal interpretations. Whereas the derivational history of Attic *stēlē* is only a sequence of diachronic events, that of *éphēna* qualifies for both: a sequence of historical changes and - given the morphophonemic alternation *phainō ~ éphēna* - the synchronic process. Obviously, the forms *éphāna* and *agon* which are crucial in the morphophonemic analysis of Attic, are more 'abstract' than the surface phonemes of pandialectal analysis which works with real Doric forms *éphāna* and *egon*.

Linguists describing a language either synchronically or diachronically tacitly assume that the multiplicity of forms is reducible to a common underlying form or proto-form. However, in both descriptions the identity hypothesis may be counterbalanced by a 'diversity' hypothesis. We may simply assume that the dialectal variation is an inherent property of both a present day language and its ancestral proto-language. For instance, it might be hard to specify sequences of sound-changes separating the following forms from a single proto-form:

<u>Attic</u>	τέτταρες	'four'	<u>Boeotian</u>	πέτταρες
<u>Ionic, Arcadian</u>	τέσσαρες		<u>Lesbian</u>	πέσσυρες
<u>West Greek</u>	τέτορες		<u>Homeric</u>	πύσυρες

This would be tantamount to deriving all four vowels /e, o, a, u,/ from a single underlying vowel *V:



Thus in historical retrospective we may view Greek way back in the 2nd Millenium B.C. as a dialectally undifferentiated

language (= identity hypothesis) or as a cluster of dialects, ancestors of classical dialects, even if nobody can say anything more definite about them (= diversity hypothesis).

At this place we have to admit that our starting point of all derivations, i.e., our reconstructions of Proto-Greek, are in a sense *a priori* hypotheses whose status appears to be justified only by the internal regularities found in the Greek dialects. They introduce a unifying principle in the diversity and multiplicity of the dialect forms which in their totality make the Greek language.

In the case of a dead language the internal reconstruction of the phonological systems of its individual dialects is quite a demanding undertaking. Whilst the diachronic description establishes the most likely sequence of historical sound-changes, which are responsible for the present stage of individual dialects, we should also explain synchronically the distribution of contrasts in individual dialects, i.e., the relationship of simultaneous elements in the system, not the substitution of one by another in time. Thus we may observe that in the 4th c. speakers of Attic had the same long high back vowel /ū/ in both the participle φέρουσα and the Gen Sg ἵππου; speakers of Corinthian had the same half-close back /ō/, and speakers of Laconian long mid back /ō/ in both words. The speakers of Attic or Corinthian could contrast Gen Sg ἵππου and Dual ἵπῳ (/ū/ versus /ō/ or /ō/ versus /ō/), whereas the speakers of Laconian could not. On the other hand, contrasts were distributed in a totally different way in Lesbian φέρουσα and ἵπῳ (diphthong /oi/ and monophthong /ō/), Central Cretan φερουσα and ἵπῳ (sequence /on/ and long mid back /ō/) and West Argolic (sequence /on/ and half-close /ō/). Gen Sg and Dual were homophonous in Lesbian and Central Cretan but not in West Argolic:

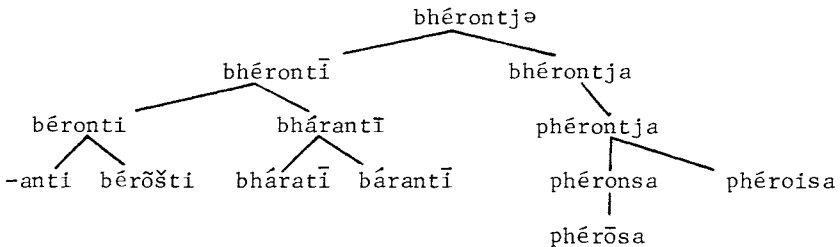
<u>Attic</u>		<u>Corinthian, Theran, West Argolic</u>	
hippū	hippō	hippō	hippō
Gen Sg	Dual	Gen Sg	Dual
<u>Messenian, Laconian, Lesbian, Central Cretan</u>			
		hippō	
		Gen Sg	Dual

The present monograph will deal not only with the phonetic description and phonemic analysis but also with the *internal reconstruction* of individual dialects. At this point it is worth mentioning that the internal reconstruction of individual dialects would sometimes be impossible without the previously established initial stage (= Proto-Greek), which

in its turn was established by means of *comparative reconstruction*. It means that Greek protoforms can be established by means of evidence from other Indo-European languages. There is nothing illicit in such a method, since the relationship between the internal and comparative (= external) reconstruction is reciprocal. It would make no sense to claim that comparative reconstruction, or vice versa, that all internal reconstruction must be completed before the other reconstruction can begin. This can be demonstrated quite easily from the data of IE languages e.g., the form of the Present Participle Feminine 'carrying':

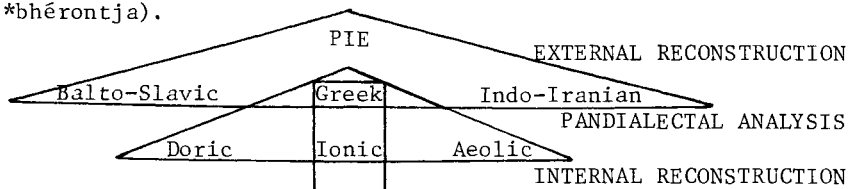
<u>Sanskrit</u>	bháratī	<u>Common Indo-Iranian</u>	?	
<u>Avestan</u>	bárantī			
<u>Doric</u>	phéronsa			
<u>Ionic</u>	phérōsa	<u>Common Greek</u>	?	Proto-Indo-European ??
<u>Aeolic</u>	phéroisa			
<u>Old Church Slav.</u>	berōšti			
<u>Slavic</u>		<u>Common Balto-Slavic</u>	?	
<u>Lithuanian</u>	-anti			

The internal reconstruction of Proto-Greek has been demonstrated on the preceding pages. The same result would be arrived at externally by comparing Indo-Iranian *bharantī* and (reconstructed) Balto-Slavic *béronti* with Greek data from individual dialects. Both Indo-Iranian and Balto-Slavic show that there was originally a consonant cluster *-nt-* (which shows up only in the Masculine counterpart in Greek *phérontos*). Since the Feminine Participle in Indo-Iranian belongs to *i-stems* and in Balto-Slavic to *jo-stems*, this would lead to a reconstruction of the Proto-Greek *ja-stem* *phérontja*. Thus the solution of the problem is seen to be as follows:



Summing up, we have seen that the internal reconstruction (= morphophonemics) of a single dialect handles sound units in connection with grammatical meaning (φέρουσα ~ φέροντος) and that on the basis of this alternation we may establish an underlying representation [p^hérontja]; pandialectal analysis

handles sound units in connection with one lexeme in different dialects (Ionic $\phi\acute{\epsilon}\rho\omicron\upsilon\sigma\alpha$, Doric $\phi\acute{\epsilon}\rho\omicron\nu\sigma\alpha$ and Aeolic $\phi\acute{\epsilon}\rho\omicron\upsilon\sigma\alpha$) and leads to Proto-Greek $*p\acute{h}\acute{e}r\acute{o}ntja$; and finally, the external reconstruction (= comparative method) handles sound units in connection with one lexeme in different genetically related languages and yields $*p\acute{h}\acute{e}r\acute{o}ntja$ (or its PIE ancestor $*bh\acute{e}r\acute{o}ntja$).



As commented by Anttila (1972:278) all these methods are essentially complementary in that they use the same mechanism and 'give ultimate units from which there is one mapping relation to the lower units ... from which one started.' A corollary of this situation is the complementarity of synchrony and diachrony. Pandialectal analysis is basically a descriptive synchronic work on dialects of a single language. Nevertheless, we may draw on the results of comparative method to confirm our inferences (for instance, a diaphoneme $[k^w]$ is establishable on the basis of interdialectal correspondences between Ionic ($\tau\acute{\iota}\varsigma$ 'who', $\tau\eta\lambda\acute{o}\theta\epsilon\nu$ 'from afar') and Aeolic (Thessalian $\kappa\acute{\iota}\varsigma$, Lesbian $\pi\acute{\eta}\lambda\omicron\theta\epsilon\nu$). This may be confirmed externally by comparative evidence of Latin *quis* or Hittite *kuiš*. Thus an abstract diaphoneme of synchronic pandialectal analysis turns out to be identical with a concrete protophoneme of historical comparative method.

1.3 METHODOLOGY OF ANCIENT GREEK DIALECTOLOGY

Some methodologically significant works in the area of Ancient Greek dialectology and linguistics have appeared in the seventies. Before reviewing these I would like to mention some older compilations which will remain valuable sources of data and information for any future investigator on the field of Ancient Greek dialects.

Three detailed handbooks dealing with Ancient Greek dialects appeared early in the 20th c.:

A. Thumb, *Handbuch der griechischen Dialekte* (Heidelberg 1909)

C.D. Buck, *Introduction to the Study of Greek Dialects* (Boston 1910)

F. Bechtel, *Griechische Dialekte* (Berlin 1921-24)

All these three works (especially the last one) have more or less the character of loose compilations which methodologically do not proceed beyond collecting and classifying of data. This is unfortunately true even about the later editions of Thumb's

work:

A. Thumb - E. Kieckers, *Handbuch der griechischen Dialekte I* (Heidelberg 1932), dealing with West Greek dialects.

A. Thumb - A. Scherer, *Handbuch der griechischen Dialekte II* (Heidelberg 1959), dealing with Aeolic, Arcado-Cypriot, Attic-Ionic and Mycenaean.

An inclusion of the Mycenaean dialect and the analysis of its phonology based on the latest achievements in Mycenology is the most significant contribution of A. Scherer.

C.D. Buck's *The Greek Dialects* (1955) surpasses methodologically all other previous works which present separate treatment of the several dialects. He considered data from all dialects simultaneously from a more or less synchronic viewpoint and elaborated a new and quite exact classification of Ancient Greek dialects. In his systematic exposition (under the heads: Vowels, Consonants, External Combination, Inflection, Word-Formation, Syntax) he discussed a large number of dialectal phenomena. On pp. 141-180, there are summaries of the characteristics of the several groups and dialects and there is also a valuable chart of the distribution of many important peculiarities common to several dialects. Buck's approach consists basically in the drawing of isoglosses and heteroglosses, which link and separate various dialects, and in the specification of the geographical distribution of individual linguistic phenomena.

The next step to take was to quantify differences and conformities and express them algebraically. This has been done by R. Coleman in his *The Dialect Geography of Ancient Greece* (1963), who selected 51 dialectal phenomena from Thumb and Buck and attempted a detailed classification of 24 dialects with the help of *correlation coefficients*. These were established by the following method: Where dialect *A* exhibits *x* items and dialects *B* and *C* respectively *x* - *b*, *x* - *c* items comparable to *A*, then if *p* of these *x* - *b* and *q* of these *x* - *c* are identical with *A*, the correlation coefficient of *A* and *B* is given by the formula $\frac{p}{x-b}$ and of *A* and *C* by the formula $\frac{q}{x-c}$. The most significant of these figures were then used in a geographic table *Greek Dialectal Affiliations*, where the arrows point to dialects of highest correlation, and 'reciprocity' is denoted by a double-headed arrow (e.g., Attic and Ionic are 'reciprocal' dialects with correlation coefficient 0.80; Aeolic dialects have following coefficients: Lesbian - Thessalian 0.56, Thessalian - Boeotian 0.58, but Lesbian - Boeotian only 0.35; the lowest correlation coefficient exists between Cypriot and Corinthian 0.13). Unfortunately Coleman did not provide a detailed account of occurrences of the 51 selected phenomena in his 24 selected

dialects, consequently his figures are hard to check; nevertheless his attempt is to be considered as an interesting pioneer attempt at a classification of Ancient Greek dialects with the help of statistical methods.

Statistical methods introduced into Greek dialectology by R. Coleman were further developed by A. Bartoněk in his typological analysis of the West Greek dialects entitled *Classification of the West Greek Dialects at the Time about 350 B.C.* (1972). In contrast to Coleman, who elaborated coefficients of conformities between individual dialects, Bartoněk established *coefficients of the differences*. The reason for this was that the author considered the number of isoglosses between the individual West Greek dialects as too high, whereas it was possible to specify the most distinct intra-Doric heteroglosses. The author also felt that a dialectal classification should start by stressing the distinguishing not the common factors. The number of heteroglosses between any pair of 18 West Greek dialects can be ascertained on Table B (pp. 130-3), which presents 44 selected dialectal phenomena. Table C 1 (Bartoněk 1972:138-9) indicates the number of relevant differences between the individual dialects. Table C 2 (1972:140-1), instead of mere sums of the single differences, gives the *differentiation coefficients* (obtained by dividing the number of *ascertained relevant differences* by the number of *items with distinctive relevance*. E.g., the coefficient of the relation between Phocian and Corinthian is represented by the quotient $11:42 = 0.26$; this figure expresses in per cent the number of differences ascertained in proportion to the total number of all comparable cases, and finally, Table C 3 (1972:142), arranged in conformity with the geographic situation, presents a graphic survey of the closest interrelations within the West Greek dialectal world.

Diametrically opposed to these pandialectal studies is Lupaş's analysis of the best known variant of Ancient Greek. L. Lupaş in her *Phonologie du grec attique* (1972) elaborated a phonological description of Classical Attic within a rigid structuralist (basically Trubetskoyan) framework on a strictly synchronic basis. The originality of her undertaking consists in the fact that she attempted a phonological description of the extinct language by methods applied in taxonomic descriptions of living languages (minimal pairs, phonotactics). A significant contribution of hers toward our deeper understanding of Attic phonology lies in her description of vocalic and consonantal allophones (pp. 57-103). Then she discusses the inventory of Attic phonemes and the phonological system. The features used for the description of the Attic phonological system are those of R. Jakobson and M. Halle (1956) -

diffuse, grave, flat and compact for vowels, compact, grave and tense for consonants. Phonological independence of the consonants /p,t,k,b,d,g,p^h,t^h,k^h,l,r,m,n,s/ is beyond doubt but there remain a number of borderline cases - geminates /pp,tt,kk,ss/ and geminated aspirates /pp^h,tt^h,kk^h/ - and she decided to include all these (and also geminated sonorants) among the consonantal phonemes of Attic. This might seem a well-founded assumption since there are minimal pairs for all geminates with the exception of /pp/ and the geminated aspirates /pp^h,tt^h,kk^h/. However, it is here that the limitations of the author's structuralist framework become most patent. Instead of being satisfied with handling the gemination by means of the prosodic feature short - long, she introduces also the feature tense - lax (only as a sub-category of the length) to cope with surface oppositions /p/ : /p^h/ and /pp/ : /pp^h/, etc.

	tense	lax
short	p	p ^h
long	pp	pp ^h

A paradox of this solution is obvious - the author must warn us that she does not consider geminated aspirates as more lax than non-geminated voiceless stops. The notation [-tense] for /pp^h/ is supposed to indicate only that geminated aspirates are less tense than geminated voiceless stops. This makes the feature tense - lax only a relative category, which can be easily disposed of from the description of Ancient Greek. Notice that all examples of geminated aspirates are borderline cases which can be ignored in the phonological analysis (mostly expressive words like ἄπῳς 'papa', τῦτῆν 'nurse', τὸν ὀλίγον 'little', καυχᾶσθαι 'laugh aloud' and names like Βάκχος).

Lupaş's work remains purely static - naturally, she did not test her features on synchronic processes (or diachronic changes) of Attic. And, of course, she did not attempt to formalize any of her descriptions by means of her predominantly acoustic features.

The greatest achievements of structuralism have to do with the concept of sound change and relative chronology. Here must be mentioned works by Ruipérez (1956), Allen (1958), Bartoněk (1966) and Szemerényi (1968). Ruipérez was the first to introduce Martinet's principles in the area of Ancient Greek - he attempted to describe and explain the development of the vocalic systems in Attic and Boeotian using the concepts of the dynamics of pressure (and counter-pressure) in the phonemic system. Bartoněk, following

Ruipé ez, reconstructed long-vowel systems of all known dialects at several pre-classical stages through the Classical Era down to the beginnings of the Hellenistic Koine ca. 350 B.C. Allen attempted the reconstruction of the prehistory of Greek dental and velar palatalization (further valuable refinements were provided recently in 1973b). Szemerényi has elaborated at length on the relative chronology of alleged Attic reopening $\bar{a}$ to $\bar{\alpha}$ and fronting $\bar{u}$ to $\bar{\bar{u}}$. A common denominator of all these (and other) studies is a more or less rigid structuralist effort to describe and explain changing phonological subsystems of a language in terms of qualitative leaps (= systematic changes), paying due attention to the graduality of sound change.

Probably the most detailed exposé of the historical phonetics of Ancient Greek dialects is Lejeune's discursive and data-oriented presentation in a framework of traditional historical linguistics. His *Phonétique historique du mycénien et du grec ancien* (1972) is based closely on the editions of 1946 and 1955. The main changes involved the incorporation of Mycenaean data which entailed some changes in relative and absolute chronology. Lejeune's basic procedure is to posit proto-forms (obtained by external and/or internal reconstruction) and to specify the sequence of sound changes which are responsible for the variation in the language, which shows up as dialectal differences. (It may be observed that there is a similarity of method between historical phonetics and generative phonology, especially in the area of pandialectal study. And just as there are profound questions to be raised as to the historical reality of protoforms, there are equally important questions concerning the psychological reality of the underlying forms used by generativists). Lejeune puts a considerable effort into specifying the relative chronology of historical sound changes. (This procedure corresponds to rule ordering in generative phonology). The following passages (1972:130 and 22), regarding the development of the cluster *-ns-* (**ntj/i*) may serve as an example:

Les altérations diverses d'un groupe *-vσ-* secondaire sont de date relativement récente. En ionien-attique, elles sont postérieures à la fermeture de $\bar{\alpha}$ en η : $\bar{\alpha}$ allongé en $\bar{\alpha}$ se conserve dans $\phi\bar{\alpha}\sigma\iota$, $\pi\bar{\alpha}\sigma\iota$, $\pi\bar{\alpha}\sigma\alpha$, etc. Dans le dorien de Théra et de Cyrène, les altérations, qui diffèrent pour les deux parlers (**-ovσa* > *ωσa* à Théra, **-ovσa* > *ovσa* à Cyrène), sont postérieures à la date de leur séparation: 630 environ.

Le fait que Cyrène ait été fondée vers 630 par les Doriens

de Théra, et le fait qu'au I^{ve} s. on observe le type παῖσα à Cyrène, le type πᾶσα à Théra, impliquent qu'au VII^e s. on devait encore avoir le type πανσα à Théra.

Finally a few words regarding the generative presentation of Ancient Greek. P. Kiparsky (1967a and 1973) is a pioneer in using the technique of generative phonology in accentology. A. Sommerstein, *The Sound Pattern of Ancient Greek* (1973), elaborated an account of the most important rules governing the pronunciation of sentences in the best known variant of Ancient Greek - Classical Attic as spoken between about 480 and 320 B.C. The authors of these works strongly emphasize that they are offering more adequate accounts than traditional taxonomic descriptions and they put a considerable effort into formalizing and ordering their generative rules. Undeniably, the rules possess greater descriptive capacity, which is inherent in their symbolism, and we apparently achieve a deeper insight into workings of the language if we can make our rules work. However, even if we manage to express ourselves more economically and abstractly it still does not mean that we are achieving a real explanation of the phenomena.

As shown above, the mechanism of the generativists' method and that of historical linguists is identical - the rules/sound changes of both operate on the underlying representations/protoforms which are reconstructable by means of internal reconstruction/comparative method. If we examine many of the sequences of rules in *The Sound Pattern of Ancient Greek* it will appear that they simply recapitulate well-known diachronic sequences of sound changes. On p. 28 Sommerstein assumes that in Attic the underlying representations of the present forms like ἐλπίζω 'hope' and φυλάττω 'guard' were essentially the same as in older forms of the language (*elpidjō and *phulakjō - reconstructable on the basis of alternations like ἐλπῖδ + ος and φύλακ + ος). Then he requires the rules to convert the clusters *gy*, *dy* into *zd*, and *ky*, *ty*, *k^{hy}*, *t^{hy}* into *tt*. These rules are: *Affrication* (send all such clusters to dental stop + fricative), *Affricate Resolution* (send /ts/ to [tt]), *Metathesis* (metathesize /dz/ to [zd]):

	phulakyō	melitya	elpidyō
<i>Affrication</i>	phulatsō	melitsa	elpidzō
<i>Affricate Resolution</i>	phulattō	melitta	-
<i>Metathesis</i>	-	-	elpizdō

Now let us compare Lejeune's account (1972:79 and 113) in terms of historical phonetics:

le groupe **ty* a tendu vers une prononciation **ts*; **ky* est d'abord passé à **ty*, puis a tendu à son tour vers **ts*. Les groupes de forms **ts* sont ensuite passés, selon les dialectes, soit à *ss* ... soit à *tt*. L'évolution des sonores a été parallèle ...

ce groupe sonore **dz* a subi interversion (à laquelle échappe le groupe sourd **ts*).

If we formalize Lejeune's account of diachronic sound changes separating proto-Greek forms and Attic forms, it will appear that not only the underlying representations of Attic are the same as in older forms of the language, but even the sequence of 'rules governing the pronunciation of sentences' only recapitulates a familiar diachronic sequence:

Sommerstein			Lejeune		
dy	ty	dy	dy	ty	dy
ts	ts	dz	ts	ts	dz
tt	tt	-	tt	tt	-
-	-	zd	-	-	zd

This comparison may highlight one fact which is easily forgotten, namely, that the form of synchronic phonological rules was originally derived from descriptions of sound-changes. This is possible because historical changes leave behind alternations which allow for the elaboration of the synchronic order of rules (these thus have to reflect the historical sequence of sound-changes to a certain degree). In our case, whereas Lejeune presents a likely sequence of historical events, Sommerstein makes claim that this sequence reflects what went on in the brain of the speakers of Classical Attic when they uttered sentences. We have to keep in mind that this is only an attractive hypothesis, whose psychological reality is still being discussed; on the other hand, the historical statement represents a fact which is unaccessible to most speakers of language. Therefore I believe that the problem of how much the historical sequences are reflected in the synchronic order of application of phonological rules and what exactly is the nature of their interdependency deserves the careful attention of linguists. I will have the opportunity to examine some of the opinions concerning this matter at several places in the book.

However, the main interest of my study lies in presenting the coherent historical exposé. A challenging task in the research into the interrelations and history of the Ancient Greek dialectal world may be formulated thus: a systematic processual treatment of the historically real sequences of

events which are responsible for the astonishing variety of all those forms found in about twenty Classical dialects. This task has been attempted in the present study.

My method will be basically that used by comparative linguistics for the reconstruction of proto-languages. As shown above this method may equally be applied to the dialects of a single language and may thus be called pandialectal analysis. On the basis of an examination of the cognate forms in various dialects I will postulate a common set of proto-forms (it will sometimes prove impossible to have a single proto-form) and try to reconstruct the most likely sequences of historical sound changes. These reconstructed sequences (= derivational histories) of individual dialects will be examined in their juxtaposition to ascertain which 'rules' are shared by various dialects and which are in individual dialects. This procedure may obviously be used to capture various relationships among genetically related dialects; relationships which are missed in structuralist typological studies. In this way we may show more convincingly the extent of similarity and the systematic cohesion of these dialects. Thus the internal differentiation of the Attic-Ionic group of dialects will be presented in this way:

	<u>Attic</u>	<u>West Ionic</u> (Euboic)	<u>Central and</u> <u>East Ionic</u>
		prāk'jō	
<i>Palatalization</i>		prāk'jō	
<i>Affrication</i>		prāt's'jō	
<i>Depalatalization</i>		prātsō	
<i>Progressive</i>			
<i>Assimilation</i>	prāttō	prāttō	<i>Regressive</i> <i>Assimilation</i> prāssō
<i>Fronting</i>	-	prāttō	prāssō
<i>Raising</i>	-	prēt̃tō	prēssō

Even if some of the sequences elaborated in this book may be only pseudohistorical or open to 'reordering' they can be taken as convenient formulae which ultimately serve the purpose of elaborating the framework for the study of dialectal variation in Ancient Greek on an historical basis.

In working on derivational histories of individual dialects, one should not lose sight of the structural phonemic patterning of the most important dialectal groups. The statement that Elean low front $\bar{ae}$ derives from Proto-Greek $\bar{o}$ through a lowering process has a certain explanatory value - but it is equally insightful and complementary to have the difference between Elean and other 'strict' Doric dialects (Laconian, Central Cretan, Cyrenaean) presented in terms of the total vowel pattern as a contrast between a quadrangular

long-vowel system and a triangular system. It is after all on the psychologically real levels of phonetics and structural phonology, not on the intermediate steps of derivational histories, which are only our reconstructions, where we tell the difference between individual dialects.

These considerations entailed the necessity of a synchronic presentation of the best known of all Classical dialects - Attic (as spoken in the 5th c.) - in order to be able to contrast the phonemic inventories of other dialects. Classical Attic is presented in the framework of structural phonology. Phonological contrasts are established by means of minimal pairs and various problems connected with the specification of the vocalic and consonantal system are discussed.

1.4 THE CLASSIFICATION OF ANCIENT GREEK DIALECTS

The Greek language at the time of the earliest alphabetical records was already considerably diversified into a number of quite distinct dialects. Inscriptions written in epichoric alphabets give evidence of the existence of differing forms of speech right down to Hellenistic times. Only some of these became literary languages; by far the larger number of dialects, which never came to play any role in literature, are known only through the inscriptions of various Greek communities.

That the ancient Greeks enjoyed their differences in speech is well-known from the comedies of the Old and Middle Period where the authors parodied speakers of Doric dialects and Boeotian. Aristophanes could distinguish a speaker of the 'mild' Doric Megarian from a speaker of the 'strict' Doric Laconian. Plato (Cratylus 434 C) reports that Eretrian (West Ionic dialect spoken in Euboea) has σκληρότηρ 'hardness' for σκληρότης. In terms of phonetics, Plato noticed that in the pronunciation of the Eretrians the final sibilant was not accompanied by a turbulent airstream since its phonetic value was only an approximant [ɣ] - a phenomenon traditionally called 'rhotacism'. In the 4th c. it was observed that the 'correct' pronunciation of words like ξύλον 'wood' was with the front [y], and the non-Attic [u] became a joke.

Unfortunately, apart from similar observations and scattered ethno-linguistic comments found mostly in Herodotus, Thucydides and Plato, we do not possess any systematic exposé coming from the Classical Period, when the provincial dialects were still in use. It is only in the 1st c. B.C., long after provincial dialects had been replaced by the Hellenistic Koine, that a more systematic passage regarding the existence of Ionic, Aeolic and Doric elements was written by Strabo in his Geography (VIII 1,2 p. 333). Strabo's tripartite grouping of Ancient Greek dialects based on geographical and thno-linguistic

criteria is basically continued by modern scholars. To be sure, Strabo is only talking about four dialects - Ionic, Attic, Doric and Aeolic (to these the Hellenistic koine was sometimes added by the ancient grammarians) and he joined them into two pairs. The first pair, Attic-Ionic, is based on the 'identity' of the Old Attic and Ionic (the colonists who founded the Ionic cities on the Asiatic shore came from Attica according to Strabo). The second pair, Doric-Aeolic, is justifiable only by the ethnic and linguistic intermingling of the Doric and Aeolic dialects following the Dorian invasion. Strabo writes that the Aeolians after the arrival of the Dorians survived in the Peloponnese only as the inhabitants of Arcadia and Elis, and that Aeolic was spoken by the Greek inlanders everywhere north of the Isthmus (with the exception of Athens, Megara and Parnassian Doris). This statement shows that Strabo's Aeolic included everything which was not classifiable as Ionic, Attic or Doric.

Let us review some incontrovertible present day views on the classification of Ancient Greek dialects and present some linguistic evidence for it in terms of isoglosses and heteroglosses.

Regarding the Dorians of Ancient Greece there was a well-founded tradition that they came originally from the North-west and throughout the historical period they formed well-defined groups geographically and linguistically. The tradition regarding their homeland in the North West is linguistically fully supported by the close relationship of the Doric dialects and North West Greek dialects (Aetolian, Locrian and Phocian). In modern scholarship, the Doric dialects are classified as a major sub-group of West Greek dialects, since in classical times these dialects were spoken mainly to the West of a line cutting the centre of the northern mainland from north to south, and were also spoken in Megara and the whole Peloponnese. In prehistoric times Doric dialects were brought to the islands of Crete, Melos, Thera, Rhodes, and Cos and to the adjacent coast of Caria.

Some general West Greek characteristics are as follows:

- (a) West Greek dialects are so-called *tī*-dialects, while East Greek dialects (Ionic, Aeolic, Arcado-Cypriot) fricated /t/ before /i/ and may be labelled *sī*-dialects:
- | | | | | | |
|---------------|-----------------------|-------------|--------|-------------------|---------|
| (3rd Pl Pres) | <u>West Greek</u> | φεροντι | versus | <u>Ionic</u> | φέρουσ |
| | and <u>Pamphylian</u> | εξαγοδ | | <u>Arcadian</u> | φερονσι |
| | | [eksagōndi] | | <u>Lesbian</u> | φέρουσ |
| (3rd Sg Pres) | <u>West Greek</u> | τιθητι | versus | <u>East Greek</u> | τίθησι |
| | and <u>Boeotian</u> | διδωτι | | | διδωσι |
- (b) 1st Pl Pres ending φέρο-μες versus East Greek. φέρο-μεν

- (c) Marker *-ks-* (instead of East Greek *-s-*) in the Future and Aorist of verbal stems in *-ζω* (the same phenomenon is also found in Arcado-Cypriot, Boeotian and Thessalian), e.g., Cretan *δυνακσει* (= *δυνασει*). (All equivalent forms given in brackets will be from the Attic dialect).
- (d) So-called 'Doric future' in *-σεω* (elsewhere *-σω*) e.g., Cretan *πραξιμεν* (= *πράξομεν*) with height dissimilation *eo* → *io*
- (e) Pronominal forms like Dat Sg *ἐμιν* (= *ἐμού*), *τιν* (= *σοῦ*)
Gen Sg *ἐμεο* (= *ἐμοῦ*), *τεο* (= *σοῦ*)

West Greek dialects are traditionally subdivided into:

- i) 'strict' Doric dialects (Laconian, Messenian, Cretan and Cyrenaean)
- ii) 'middle' Doric dialects (West Argolic and East Aegean Doric)
- iii) 'mild' Doric dialects (dialects spoken in the Saronic gulf: Megarian, Corinthian and East Argolic, and North West dialects).

'Strict' Doric dialects do not distinguish between Proto-Greek /*ē,ō*/ and the secondary /*ē,ō*/ arising through the compensatory lengthenings and isovocalic contractions. Their vocalic system preserves the Proto-Greek system of long vowels /*ī,ē,ā,ū,ō*/ with three levels of aperture.

On the other hand, 'middle' and 'mild' Doric dialects changed the Proto-Greek 3-level system into a 4-level one /*ī, ē, ē̄, ā, ū, ō*/. The close mid vowels /*ē̄*/ and /*ō̄*/ resulted here from compensatory lengthenings and isovocalic contractions.

The remaining 'non-West' Greek dialects belong to three groups: Ionic, Arcado-Cypriot and Aeolic.

The Ionic group (or Attic-Ionic) is made up of Attic and Ionic dialects spoken on the island of Euboea, the Cycladic islands and on the coast of Asia Minor. The linguistic unity of these areas is fully supported by ancient tradition and archaeological evidence. That the insular Ionians were akin to the inhabitants of Attica was a well-known fact in the Greek history, this being the result of the Ionian colonization of the Aegean islands. This Ionian colonization reached the Asiatic shore sometime in the Dark Age (11 - 9th c.). What is uncertain is the original extent of the Ionic territory on the European mainland. According to Strabo, Ionians lived even in the Peloponnese, and it could be that at least the entire shore of the Saronic gulf was once Ionic, before the local dialects were replaced by Doric dialects.

Some notable Attic-Ionic characteristics are:

- (a) Fronting and raising of Proto-Greek **ā* → *ē̄* → *ī̄*
(b) 3rd Pl Aorist of athematic verbs, and Aorist Passive

endings in -σαν (elsewhere in -ν):

ἔθενσαν, ἐλύθησαν elsewhere ἔθεν, ἐλυθην

(c) 3rd Sg Impf $\tilde{n}v$ 'he was', elsewhere $\tilde{n}s$ (<* $\tilde{e}s$ + t)

(d) Movable $-n$ in verbal forms in $-\sigma v(v)$ and $-\varepsilon(v)$ in the environment before both vowels and consonants

(e) Pronominal forms: Nom Pl in -εϰς elsewhere in -εϰ

Attic ἡμεῖς 'we' versus Lesbian ἄμμες, Doric ἄμες
 ὕμεῖς 'you' ὕμμες ὕμες

Acc Pl in -έας (or -ᾶς) elsewhere in -ε

Attic ἡμεῖς 'us' versus Lesbian ἄμμε, Doric ἄμε
 ὑμεῖς 'you' ὕμμε ὕμε

Arcadian (spoken in central Peloponnese) and Cypriot are two 'peripheral' dialects that have in common a number of peculiarities which are unknown (or only sporadically documented) elsewhere. In view of their geographic disparity this is astonishing, especially when we recall that our written documents come from the 5th and 4th c. Presently it is believed that these two dialects represent remnants of the originally homogenous dialect(s) of Mycenaean Greece. According to some scholars even the dialect spoken in Pamphylia (southern coast of Asia Minor) belongs to this group; others classify it as belonging to the Aeolic group. Pamphylian is poorly recorded and the only major inscription does not suffice to decide the matter.

In Arcado-Cypriot (but there is some evidence even from Pamphylian and Lesbian) short mid vowels in certain positions are raised /e,o/ → /i,u/:

i) /e/ before a dental nasal (even elsewhere but the evidence is scanty)

Arcadian ἐν 'in' (= ἐν), ἰνδολος 'right' (= ἔνδολος)
μεινονσαι 'remaining' (= μένουσαι)

Cypriot ἔναλινω 'write upon'

ii) final /o/, and /o/ before a labial nasal

Arcadian ὑπυ [hopu] 'under' (= ὑπό [hupo])
 ἐγάμαντο 'got married' (= ἐγήμαντο)
 ὁμοιος 'similar' (= ὁμοιος)

Cypriot γενοῦντο 'happen' (= γένοντο)

Other most notable characteristics of Arcado-Cypriot are dative constructions of prepositions ἄνω and ἐξ (elsewhere ἄπό and ἐξ + Genitive) and some special lexical items like κας 'and' (elsewhere καί), πος 'near by' (elsewhere πρός), etc.

In modern scholarship the Aeolic group includes the dialect of the island of Lesbos, and Thessalia and Boeotia on the European mainland. There are some fundamental isoglosses linking these three dialects:

- (a) Proto-Greek labiovelars *k^w and *g^w became labials /p/ and /b/ in all environments (elsewhere only before non-high back vowels and consonants).
- (b) Aeolic dialects have the marker *-ont-* in the Perfect Participle, where other dialects have the original marker *-ónt-* e.g., Lesbian κατεληλύθοντος 'descend' (= κατεληλυθότος).
- (c) /o/ instead of /a/ before or after liquids e.g., Lesbian στρότος 'army' (= στρατός), Thessalian βροχὺς 'short' (= βραχύς).

On the other hand, there are considerable diversities between Boeotian-Thessalian and Lesbian explainable partially by their geographical distance and the influence of neighbouring dialects - West Greek influence on Boeotian and Thessalian greater in the case of the West Thessalian area (= Thessaliotis) and Ionic influence on Lesbian. Perhaps the most important diversity regards the Proto-Greek clusters of the type {Liquid
Nasal} + Sibilant, Sibilant + {Nasal
Liquid} and *ln. These are reflected as geminates in Thessalian and Lesbian but non-geminates in Boeotian, e.g., Proto-Greek *g^we/oln- Lesbian βόλλομαι 'wish', βόλλα 'counsel', Thessalian βελλομαι but Boeotian βειλομαι, βωλα (cf. West Greek δειλομαι, βωλα); Proto-Greek *esmi 'I am', Lesbian, Thessalian ἐμμυ but Boeotian ἔμυ.

Only Boeotian among Aeolic dialects has a geminate /tt/ for Proto-Greek clusters *ts, *t(h)j and *k(h)j. Lesbian and Thessalian (with some exceptions) show /ss/, e.g. Proto-Greek *kārukjō, Boeotian καρυττω 'proclaim' *methjos μεττος 'middle' but Lesbian καρύσσω μέσσος

CLASSIFICATION OF CLASSICAL GREEK DIALECTS (5th c. B.C.)

I. WEST DIALECTS

- | | | |
|----------|---|---|
| | 1 | North-West group (Aetolian, Locrian, Phocian) |
| 'mild' | | |
| Doric | 2 | Saronic group (Corinthian, Megarian, East Argolic) |
| | 3 | West Argolic |
| 'middle' | | |
| Doric | 4 | East Aegean group (Doric dialects spoken on the islands Thera, Rhodes, Cos) |
| | 5 | Cretan group (Central Cretan, East Cretan) and Cyrenaean |
| 'strict' | | |
| Doric | 6 | Laconian-Messenian group (Laconian, |

Messenian)

Achaean subgroup (spoken in North

Peloponnesian Achaea)

- 7 Elean (isolated dialect of a transitional type between the North West group and Peloponnesian Doric)

II. ATTIC-IONIC DIALECTS

- 1 Attic
- 2 West Ionic (Euboean)
- 3 Central Ionic (Cycladic)
- 4 East Ionic (Ionic of Asia Minor)

III. ARCADO-CYPRIOT

- 1 Arcadian
- 2 Cypriot
- 3 Pamphylian (classified as Aeolic by some scholars)

IV. AEOLIC DIALECTS

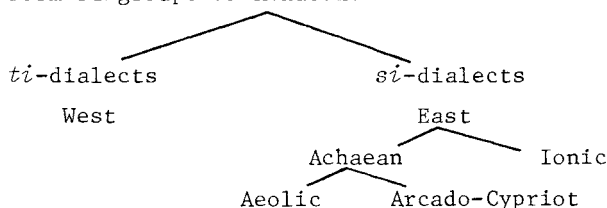
- 1 Lesbian
- 2 Thessalian group (with several regional varieties spoken in Pelasgiotis, Thessaliotis, Hestiaeotis, and Magnesia)
- 3 Boeotian

Quite problematic is the reconstruction of dialect pre-history and the origins of the main historical divisions; undoubtedly this will continue as the most disputed facet of Greek dialectology. The old theory of the invasion of Greece by three separate waves of Greek-speaking people sometime during the 2nd Millenium is insufficient, since this theory simply transfers the problem without attempting a solution. The three main dialectal groupings of Ancient Greece are simply identified with the three independent invasions and the historical diversity of Greek dialects reflects a further internal differentiation of these groups after their arrival in Greece. As summed up by Chadwick (1969:81), the three-wave theory implies that the formation of the Greek language took place *outside* Greece and this seems to be unnecessary. There is some archaeological evidence that the first Greek speakers could be identical with the carriers of the Middle Helladic culture and that they might have entered some parts of Greece before the end of the 3rd Millenium i.e., the genesis of the Greek language can be set *inside* Greece (or the southern Balkan area).

The only incontestable fact of the dialectal differentiation of the Greek world in the Late Helladic (or Mycenaean) period is the absence of West Greek characteristics

in the language of the tablets written in Linear Script B. This is not surprising, given the isolation of the West Greek tribes in the mountainous North-West. One of the first coherent reconstructions of dialect prehistory, elaborated by Risch (1955), presents a basic dialectal difference between the *ti*- and *si*- dialects in the Late Helladic period: the *ti*- dialect group comprised the Mycenaean ancestors of both Classical Doric and Aeolic dialects (= *North Greek* area), and the *si*- dialect group comprised the language of LB texts, which was labelled as proto-Ionic-Arcado-Cypriot (= *South Greek*).

Chadwick's reconstruction (1963:8) of dialect prehistory differs from the earlier theory of Risch in the substitution of 'Achaean' for Aeolic, thus allowing Aeolic and Arcado-Cypriot to form subgroups of Achaean:



The language (or dialect) of Linear B texts, so-called Mycenaean, is surprisingly undifferentiated, whether the texts come from Crete or the Peloponnese. Various hypotheses have been elaborated to explain this fact. Some scholars see Mycenaean as a *supradialectal formation* arising out of a mixture of Proto-Arcado-Cypriot, Proto-Ionic and Proto-Aeolic elements. This kind of Koine-formation supposedly ended its existence with the fall of the culture which it served, as the mixed interdialectal speech of the population living directly in the Mycenaean centers (Mycenae, Pylos, Thebes on the mainland: Knossos, Phaistos, Tylissos, etc. in Crete). Other scholars think of Mycenaean as an *extinct dialectal branch* of the late Helladic stem of Greek dialects.

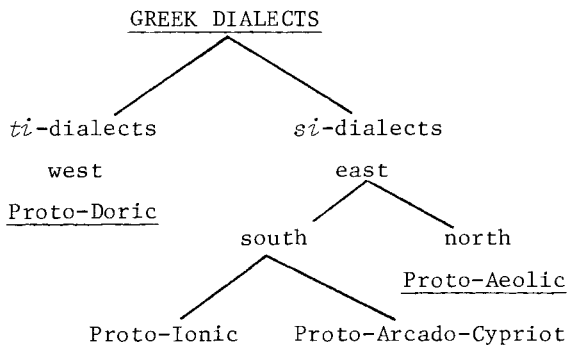
According to Bartoněk (1972:19) Mycenaean was originally spoken in the Peloponnese and is most *closely related to* (but not fully identical with) the postulated Late Helladic ancestor(s) of the *Arcado-Cypriot group*; Mycenaean also seems to be *closely linked up* with the postulated ancestor of the *Aeolic group*.

Thus the hypothetical differentiation of Greek dialects spoken in the Late Helladic period (= the last centuries of the 2nd Millenium) is more or less a back-projection of the four principal dialectal groups of the classical times. The criterion is basically a *geographical* one:

Proto-Doric } autonomous dialectal units
Proto-Aeolic }

Proto Ionic } two closely linked dialectal groups
Proto-Arcado-Cypriot }

Thus we may propose the following scheme:



1.5 THE DECLINE OF CLASSICAL DIALECTS

The spread of Attic-based Koine (starting in the 4th c. B.C.) caused the apparent gradual disappearance of the provincial dialects. The reasons for the ultimate supremacy of Attic are to be sought in the political, social and cultural conditions back in the 5th c. At this time Athens became the political and intellectual centre of Greece, and the Attic dialect became the recognized 'standard' language of literary prose. This can be observed first of all in the territory of the related Ionic dialects, which were the first to yield to the pressure of Attic and lose their identity as distinct dialects. Some signs of this may be seen in Ionic inscriptions from various islands already by the 5th c., and from the beginning of the 4th c. in the inscriptions from Ionic cities in Asia Minor. It was this kind of Attic-based Koine, well established in territory originally Ionic and in several respects modified and enriched by Ionic elements (the most characteristic feature of this influence being the substitution of Ionic $\sigma\sigma$ for the $\tau\tau$ of 'pure' Attic e.g., $\theta\acute{\alpha}\lambda\alpha\sigma\sigma\alpha$), that the Macedonians spread through the whole of the Eastern Mediterranean and made an official language of their empire by the end of the 4th c.

The detailed history of the gradual eclipse of other dialectal groups will be a subject of another study of mine (in preparation). We can safely assume that local dialects continued to be spoken in the countryside long after they had been overlaid by Attic Koine and had lost their prestige

among the urban upper class. The practical consequence of this situation was that dialects ceased to be used in inscriptions. This is unfortunate for us since the failure of this primary source prevents us from having adequate evidence regarding the length of survival of individual dialects, as a means of oral communication, especially in originally non-Ionic territories.

According to Debrunner (1954:34-69), Doric dialects proved to be most tenacious of all, especially in the Peloponnese and East Aegean regions (island of Rhodes). During the 3rd and 2nd c. B.C. the local Doric dialects of the Peloponnese were replaced in official inscriptions by the Doric Koine of the Achaean League. This dialectal formation was essentially Doric retaining distinctive West Greek dialectal characteristics, but with a trend to eliminate local peculiarities and with a strong admixture of forms from Attic Koine. After the dissolution of the Achaean League by the Romans (in 146 B.C.), the Doric Koine, in its turn, was replaced in official inscriptions by common Hellenistic Koine. In Rhodes, which was never humiliated by the Romans, there are still in the 1st c. A.D. many inscriptions in the more or less consistent local variant of late East Aegean Doric. There is even some evidence in contemporary writers that Doric dialects continued to be spoken in the 1st and 2nd c. A.D. Thus Suetonius (Tib. 56) indicates that in the 1st c. A.D. 'Dorice Rhodii loquuntur'. Dio Chrysostom, about 100 A.D., met an old woman in the Peloponnese who was 'δωρὺζουσα τῇ φωνῇ'. According to Pausanias (4.27.11), Messenians were still using their Doric dialect in the 2nd c. A.D.

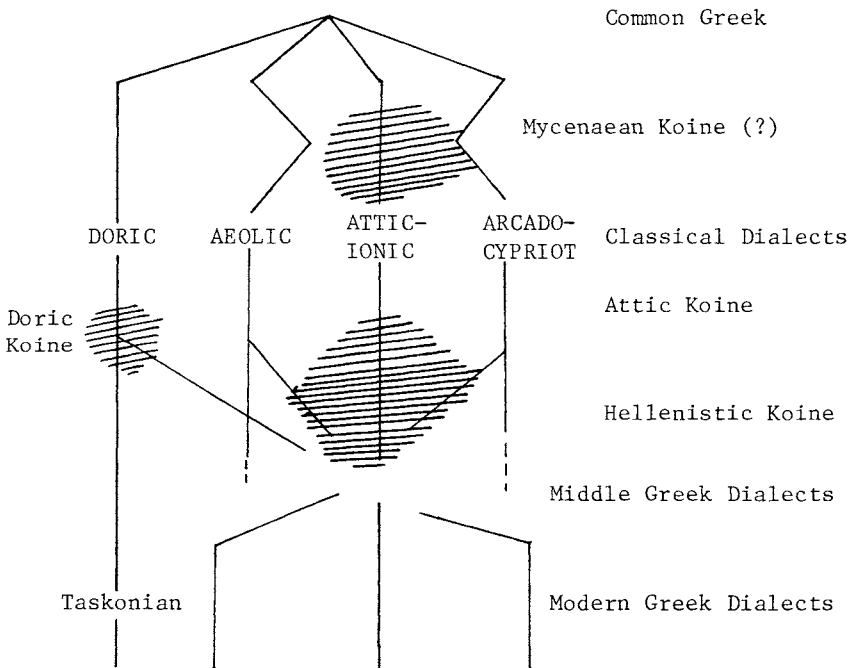
While by the end of the 2nd c. B.C. all inscriptions from the Ionic islands and Asia Minor are in Hellenistic Koine, the Aeolic dialect was used in the inscriptions of the island of Lesbos until the 1st c. B.C. Thessalian and Boeotian did not last so long. An interesting phenomenon was the 'revival' of Lesbian dialect in the 2nd c. A.D., when there appeared some inscriptions in a sort of 'corrupted' Lesbian. Scholars do not agree if this was only an artificial revival, a piece of antiquarianism, which had nothing to do with the dialect which had long ceased to be spoken, or a real revival to literary use of a dialect which perhaps had survived throughout the interval of several centuries as a local patois. Considering the situation in other peripheral areas (such as the Doric Peloponnese or Rhodes), the second possibility is certainly very likely, especially if we recall that Aeolic accentuation was quite different from Attic. The same is true of Doric dialects (see below Chapter Four, p. 153 ff.), as partly documented by late inscriptions from the remote regions of

the Peloponnese and Crete. Doric dialects (or rather local variants of the Hellenistic Koine coloured by Doric dialect features) persisted for several centuries into the Christian Era.

As is well-known, Modern Greek dialects go back ultimately to the Hellenistic Koine, with the one notable exception of Tsakonian, which derives not from the Hellenistic Koine but from some type of late Peloponnesian Doric (as mentioned above, this was contaminated by Attic Koine in the 2nd - 1st c. B.C.). Modern Tsakonian is completely isolated from Modern Peloponnesian dialects and is spoken in several villages only, located on the seaward slopes of Mount Parnon in the east Peloponnese.

The phenomena of *convergence* and *divergence* in the history of Greek dialects can be diagrammed as in Figure 1-2.

Figure 1-2. Convergence and divergence in the history of Greek dialects.

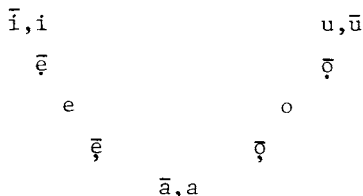


- (a) e - o λέχος 'bed' - λόχος 'ambush'
 ē - ȝ λυπεῖν 'be pained' (Inf) - λυποῦν (Part Neuter)
 ē - ȝ ἄλλην 'other' (Acc Sg Fem) - ἄλλων (Gen Pl)
 i - u πίστις 'faith' - πύστις 'inquiring'
 ī - ū μηνῶ 'be wroth against' - μηνῶ 'reveal'
 ē - ā νίκης 'victory' (Gen Sg) - νίκᾱς (Acc Pl)
 (b) a - e φύλακας 'guards' (Acc Pl) - φύλακες (Nom Pl)
 i - e λύθητι 'loose' - λύθητε (2nd Pl Imp
 (2nd Sg Imp Aor Pass)- Aor Pass)
 ī - ē νίκη 'victory' - νείκη 'quarrels' (Pl)
 u - o τῦκος 'mason's hammer' - τόκος 'childbirth'
 ū - ȝ νῦν 'now' - νοῦν 'mind' (Acc Sg)
 (c) o - a λυσόμενος (Part Fut Middle) - λυσάμενος (Part Aor Middle)

- $\bar{o}$ - $\bar{a}$ ντκῶν 'conquer' (Part) - ντκᾶν (Inf)
 (d) $\bar{e}$ - $\bar{\epsilon}$ φιλεῖτε 'love' (2nd Pl Ind) - φιλήτε (2nd Pl Subj)
 $\bar{o}$ - $\bar{\omicron}$ χρυσοῦμεν 'gild' (1st Pl Ind) - χρυσῶμεν (1st Pl Subj)
 (e) a - $\bar{a}$ λυπηρά 'painful' (Pl Neuter) - λυπηρᾶ (Sg Fem)
 e - $\bar{e}$ λύετε (2nd Pl Ind) - λύητε (2nd Pl Subj)
 e - $\bar{\epsilon}$ ἔχομεν 'have' (1st Pl Pres) - εὔχομεν (1st Pl Impf)
 i - $\bar{i}$ ἱκετεύομεν 'supplicate' (1st Pl Pres) - ἱκετεύομεν (1st Pl Impf)
 o - $\bar{o}$ κακός 'bad' (Adj) - κακῶς (Adv)
 o - $\bar{\omicron}$ λόγος 'word' (Nom Sg) - λόγους (Acc Pl)
 u - $\bar{u}$ ὑβρίζομεν 'be insolent' (1st Pl Pres) - ὑβρίζομεν (1st Pl Impf)

For the purpose of interdialectal comparison Classical Attic vowels will be presented by means of the traditional pseudoarticulatory diagram in Figure 2-1.

Figure 2-1. Vocalic phonemes of Classical Attic (5th B.C.)



Key-words:

/ī/ νίκη 'victory'	/ū/ θῦμός 'spirit, mind'
/i/ πίστις 'faith'	/u/ λυπηρός 'painful'
/ē/ εἰμὶ 'I am'	/ō/ φεύγουσα 'fleeing' (Fem)
/e/ λέχος 'bed'	/o/ λόχος 'ambush'
/ē/ φημί 'I say'	/ō/ χώρα 'country'
/a/ ἄλλος 'other'	
/ā/ πράττω 'I make'	

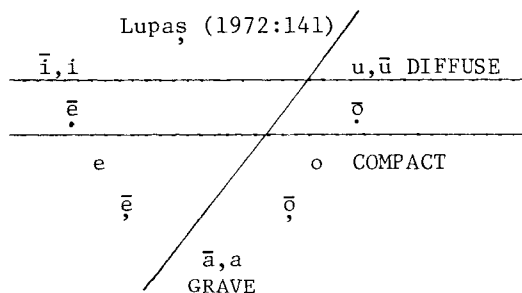
An alternative way of presenting Attic phonemes is a classificatory matrix. Five features are necessary to specify all Attic phonemes: a prosodic feature of length ($\pm$ long), two articulatory features specifying the highest position of the tongue in a vertical dimension ($\pm$ high, $\pm$

low), a horizontal dimension ($\pm$ front) and an articulatory feature of lip shape ($\pm$ round).

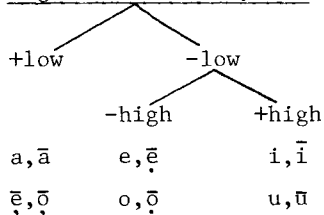
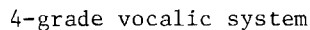
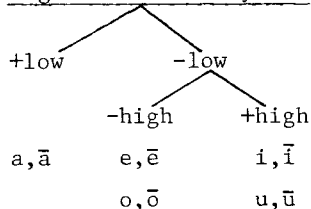
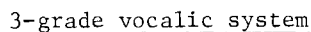
Figure 2-2. Distinctive features of the vocalic phonemes of Classical Attic.

	i	ĩ	e	ẽ	ẽ̃	a	ā	u	ū	o	ō	ō̃
Long	-	+	-	+	+	-	+	-	+	-	+	+
Low	-	-	-	-	+	+	+	-	-	-	-	+
High	+	+	-	-	-	-	-	+	+	-	-	-
Front	+	+	+	+	+	-	-	-	-	-	-	-
Round	-	-	-	-	-	-	-	+	+	+	+	+

A problem arises in deciding how to classify the short mid vowels /e/ and /o/ of Classical Attic. Lupaş classifies them as compact (= low):



My main reason for classifying the short mid vowels as non-low stems from other dialects (Arcado-Cypriot, Lesbian and 'strict' Doric dialects) which have 3-grade vocalic systems as opposed to the 4-grade systems of Attic and other dialects. In these dialects neither the long nor the short mid vowels exhibit the low - non-low opposition. This results in a non-low specification for *e/o* and there is no reason for assuming a difference in 4-grade systems.



In other words, dialects with 4-grade vocalic system (like Attic) contrasted long mid vowels as low and non-low (or half-open and half-close) but dialects with 3-grade

vocalic system (like Laconian) did not know this contrast.

2.1.2 *The Vowels of the Greek Dialects about 350 B.C.*

Ancient Greek dialects spoken in the 4th c. B.C. can be classified into two major groups (with several subgroups) according to their vocalic systems: those possessing a 3-grade vocalic system and those possessing a 4-grade vocalic system. All dialects have the palatal glide /j/ and the velar glide /w/, which form diphthongs with several vowels.

(i) The first group of dialects with the 3-grade vocalic system is represented by 'peripheral' dialects:

- a) The Arcado-Cypriot group
- b) Lesbian (Aeolic group)
- c) The 'strict' Doric dialects (Laconian, Messenian, Central Cretan and Cyrenaean)

In historical retrospective it can be said that these dialects preserved the Proto-Greek vocalic system of five short and long vowels.

Figure 2-3. Vocalic phonemes of Laconian (about 350 B.C.)

$\bar{i}, i$	$u, \bar{u}$
$\bar{e}, e$	$o, \bar{o}$
$\bar{a}, a$	

The key words for Laconian are the same as those of Classical Attic with these differences:

ημυ / $\bar{e}\mu i$ / 'I am'
 φαμυ / $p^h\bar{a}\mu i$ / 'I say' φευγωσα / $p^heug\bar{o}sa$ / 'fleeing' (Fem)

Note: ημυ and φευγωσα are spelled in the Ionic alphabet.

Figure 2-4. Distinctive features of the vocalic phonemes of Laconian (about 350 B.C.)

	i	$\bar{i}$	e	$\bar{e}$	a	$\bar{a}$	u	$\bar{u}$	o	$\bar{o}$
Long	-	+	-	+	-	+	-	+	-	+
Low	-	-	-	-	+	+	-	-	-	-
High	+	+	-	-	-	-	+	+	-	-
Front	+	+	+	+	-	-	-	-	-	-
Round	-	-	-	-	-	-	+	+	+	+

The dialect spoken in Elis (West Peloponnese) differs from all other 'peripheral' dialects by its front low $\bar{a}\bar{e}$. Thus in Elean there are three low vowels ($\bar{a}\bar{e}$, a , $\bar{a}$) - only two elsewhere, and five front vowels ($\bar{i}$, i , $\bar{e}$, e , $\bar{a}\bar{e}$) - only four elsewhere.

Figure 2-5. Vocalic phonemes of Elean (about 350 B.C.).

$\bar{i}, i$	$u, \bar{u}$
$\bar{e}, e$	$o, \bar{o}$
a	
$\bar{a}\bar{e}$	$\bar{a}$

The source of Elean $a\bar{e}$ was the Proto-Greek $*\bar{e}$ which was lowered in this dialect. A new secondary $\bar{e}$ resulted from the first compensatory lengthening (or contraction $e + e$) sometime in the 10th c. This hypothesis is based on the observation that since the earliest Elean inscriptions (first half of the 6th c.) the primary Proto-Greek $*\bar{e}$ is spelled with the letter $\bar{A}$, which at the same time was also used for the Proto-Greek $\bar{a}$. Since it is unlikely that Proto-Greek $\bar{e}$ changed into $\bar{a}$ in this dialect, it is believed that the Elean reflex of Proto-Greek $*\bar{e}$ is a front low vowel $\bar{e}$ or rather $\bar{ae}$. On the other hand, the new secondary $\bar{e}$, which originated through the first compensatory lengthening or contraction, is spelled with the letter $\bar{E}$. For the difference in spelling, contrast Elean $\bar{\epsilon}\alpha\tau\tau\alpha$ / $wr\bar{e}\alpha tr\bar{a}$ / 'verbal agreement' from Proto-Greek $*wr\bar{e}\alpha tr\bar{a}$ (preserved in Attic $\bar{\rho}\eta\tau\tau\alpha$ / $r\bar{e}\eta tr\bar{a}$ / with $\epsilon\mu\epsilon\nu$ / $\bar{e}men$ / 'to be' from Proto-Greek $*esmen$ ($\longrightarrow ehmen \longrightarrow \bar{e}men$).

Some of the Attic contrasts (4-grade vocalic system) did not exist or were distributed differently in the 'peripheral' dialects (Arcado-Cypriot, Lesbian and 'strict' Doric dialects, which show 3-grade vocalic system).

In Attic-Ionic the opposition front low / $\bar{e}$ / - back low / $\bar{a}$ / differentiates the Gen Sg and Acc Pl of stems in $-\bar{a}$. The forms found in various other dialects are differentiated additionally in some other segment or are homophonous:

	<u>Gen Sg</u>	<u>Acc Pl</u>
<u>Attic-Ionic</u>	$\nu\acute{\iota}\kappa\eta\varsigma$ / $n\bar{i}k\bar{e}s$ /	$\nu\acute{\iota}\kappa\alpha\varsigma$ / $n\bar{i}k\bar{a}s$ /
<u>Cretan, Argolic</u>	$\nu\iota\kappa\alpha\varsigma$ / $n\bar{i}k\bar{a}s$ /	$\nu\iota\kappa\alpha\nu\varsigma$ / $n\bar{i}k\bar{a}ns$ /
<u>Lesbian, Elean</u>	$\nu\iota\kappa\alpha\varsigma$ / $n\bar{i}k\bar{a}s$ /	$\nu\iota\kappa\alpha\iota\varsigma$ / $n\bar{i}k\bar{a}is$ /
<u>Theran, Cyrenaean</u>	$\nu\iota\kappa\alpha\varsigma$ / $n\bar{i}k\bar{a}s$ /	$\nu\iota\kappa\alpha\varsigma$ / $n\bar{i}k\bar{a}s$ /

In Attic this opposition also differentiates Singular and Dual in the Nominative. However, even in Attic this opposition was limited; it did not appear in stems in $-\bar{e}\bar{a}$ $-\bar{i}\bar{a}$ $-\bar{r}\bar{a}$. Furthermore dual forms are rare in dialects (they are not documented in Ionic and Cretan inscriptions). The Boeotian example illustrates the analogical extension of the Masculine $-\bar{o}$ into the Feminine (incidentally, Boeotian had the opposition / $\bar{e}$ / - / $\bar{a}$ /):

	<u>Singular</u>	<u>Dual</u>
<u>Attic</u>	δραχμή 'drachm'	δραχμά (δύο)
<u>Boeotian</u>	δραχμα	δραχμαω (δυο)

In Attic-Ionic the opposition half-close / $\bar{o}$ / - half open / $\bar{o}$ / is used to differentiate the 3rd Pl Indicative and Subjunctive of thematic verbs. In other dialect groups we find the opposition short /o/ - long / $\bar{o}$ / (as in Attic-Ionic in the 1st and 2nd Pl):

	<u>3rd Pl Ind.</u>	<u>3rd Pl Subj.</u>
<u>Attic-Ionic</u>	φέρουσιν /pherōsi/	φέρωσι /pherōsi/
<u>Doric</u>	φεροντι /pheronti/	φερωντι /pherōnti/
<u>Lesbian</u>	φέρουσι /pherōisi/	φέρωσι /pherōisi/
<u>Arcadian</u>	φερονσι /pheronsi/	φέρωνσι /pherōnsi/

In Attic-Ionic this opposition is also used to differentiate the Indicative and Subjunctive of contract verbs in -*e* (with the exception of the 1st Sg) and -*o* (with the exception of singular forms). This was impossible in peripheral dialects, where the Indicative and Subjunctive of contract verbs in -*o* were homonymous:

	<u>Indicative</u>	<u>Subjunctive</u>
<u>Attic-Ionic</u>	χρυσοῦμεν /kʰrūsōmen/	χρυσῶμεν /kʰrūsōmen/
<u>'strict' Doric</u>	χρυσόμεν /kʰrūsōmes/	χρυσόμεν /kʰrūsōmes/
(in the Ionic alphabet)	χρυσωμεν	χρυσωμεν

(ii) The second group of dialects, characterized by a 4-grade vocalic system, is represented by the 'mild' and 'middle' Doric dialects, Euboean and Pamphylian.

- North-West dialects (Aetolian, Locrian, Phocian)
- Megarian and Argolic (both East and West)
- East Aegean Doric
- Euboean (Ionic dialect of the island of Euboea)
- Pamphylian

Figure 2-6. Vocalic phonemes of dialects with the 4-grade vocalic system.

$\bar{i}, i$	$u, \bar{u}$
$\bar{e}$	$\bar{o}$
e	o
$\bar{e},$	$\bar{o},$
$\bar{a}, a$	

The dialect spoken in Boeotia differed from the above system in that it did not have the contrast between a half-close and half-open back vowel:

Figure 2-7. Vocalic phonemes of Boeotian (about 350 B.C.)

$\bar{i}, i$	$u, \bar{u}$
$\bar{e}$	
e	$o, \bar{o}$
$\bar{e}$,	
$\bar{a}, a$	

The Classical Attic vocalic system was changed through the fronting of high back vowels $\bar{u} \rightarrow \bar{i}$ and raising of a half-close back $\bar{o} \rightarrow \bar{u}$ about 400 B.C. The same changes took place in the insular Ionic dialects (with the exception of Euboean).

Figure 2-8. Vocalic phonemes of post-Classical Attic-Ionic (about 350 B.C.).

$\bar{i}, i$	$\bar{u}, \bar{u}$	$\bar{u}$
$\bar{e}$		o
e		
$\bar{e}$,		$\bar{o}$
$\bar{a}, a$		

Following is a set of words showing differences between Classical Attic (see p. 33) and post-Classical Attic-Ionic:

θυμός	/t ^h $\bar{u}$ mós/	'spirit, mind'
λυπηρός	/l ^h up $\bar{e}$ rós/	'painful'
φεύγουσα	/p ^h eúgūsa/	'fleeing' (Fem)

Figure 2-9. Distinctive features of the vocalic phonemes of post-Classical Attic-Ionic (about 350 B.C.)

	i	$\bar{i}$	e	$\bar{e}$	$\bar{e}$,	a	$\bar{a}$	$\bar{u}$	$\bar{u}$	$\bar{u}$	o	$\bar{o}$
Long	-	+	-	+	+	-	+	+	-	+	-	+
Low	-	-	-	-	+	+	+	-	-	-	-	-
High	+	+	-	-	-	-	-	+	+	+	-	-
Front	+	+	+	+	+	-	-	+	+	-	-	-
Round	-	-	-	-	-	-	-	+	+	+	+	+

2.1.3 *The Alphabet*

In terms of the pre-Euclidean, epichoric, alphabet and the post-Euclidean (after 403/2 B.C.) Ionic alphabet, phonetic values of the Classical and Post-Classical Attic were represented as below:

<u>Pre-Euclidean Alphabet</u>	<u>Ionic Alphabet</u>	<u>Phonemic Values (5th c.)</u>	<u>(4th c.)</u>
I	I	i, $\bar{i}$	i, $\bar{i}$
E, EI	EI	$\bar{e}$	$\bar{e}$
E	E	e	e
E	H	$\bar{e}$	$\bar{e}$
A	A	$\bar{a}$, $\bar{a}$	$\bar{a}$, $\bar{a}$
Y	Y	u, $\bar{u}$	$\bar{u}$, $\bar{u}$
O	O	o	o
O	Ω	$\bar{o}$	$\bar{o}$
O, OY	OY	$\bar{o}$	$\bar{u}$

e.g. 5th c. spellings

AAAON /allon/
 AAAON /all $\bar{o}$ n/
 AAAOZ /all $\bar{o}$ s/
 OYTE / $\bar{o}$ te/

4th c. spellings

AAAON /allon/
 AAAON /all $\bar{o}$ n/
 AAAOYZ /all $\bar{u}$ s/
 OYTE / $\bar{u}$ te/

2.2 THE DIPHTHONGS OF CLASSICAL ATTIC

In the following discussion the main emphasis will be on the surface contrasts of Classical Attic. We are aware of the fact that it is controversial to claim that language can have short and long diphthongs.

Classical Attic had nine diphthongs,¹ five short and four long. [ei] can be regarded as a combinatory variant of / $\bar{e}$ / before a vowel while long diphthongs [$\bar{a}u$] and [$\bar{o}u$] result only from the contraction o + au.

<u>Short</u>		<u>Long</u>
[ei]	ui eu	$\bar{e}i$ $\bar{e}u$
oi		$\bar{o}i$ [$\bar{o}u$]
ai	au	$\bar{a}i$ [$\bar{a}u$]

Short and long diphthongs generally occur in all environments with the following restrictions:

- short diphthongs do not occur before high vowels
- diphthongs [ei] and /ui/ do not occur before consonants
- long diphthongs [$\bar{a}u$], [$\bar{o}u$] and / $\bar{e}u$ / occur only before consonants

Phonotactics of Attic Diphthongs

<u>Short</u>	ei	oi	ai	ui	eu	au	
before non-high vowel	+	+	+	+	+	+	
before consonant	-	+	+	-	+	+	
finally	+	+	+	+	+	+	
<u>Long</u>	ēi	ōi	āi		ēu	āu	ōu
before vowel	+	+	+		-	-	-
before consonant	+	+	+		+	+	+
finally	+	+	+		-	-	-

Note that long diphthongs before vowels are much more restricted:²

/āi/ occurs before mid back vowels (with the exception of /ō/)

/ēi/ occurs before mid vowels (with the exception of /ē/)

/ōi/ occurs before non-high vowels (with the exception of /ē/)

Given these restrictions only the following minimal pairs are possible for short diphthongs (only diphthongs with the identical first or second component will be contrasted):

- a) /au/ - /eu/
- | | |
|--------------------------|------------------------|
| - V : αὖω 'light a fire' | - εὖω 'sing' (Homeric) |
| - C : αὐλή 'court' | - εὐλή 'worm' |
| - # : αὖ 'again' | - εὖ 'well' |
- b) /au/ - /ai/
- | | |
|-----------------------------|---------------------------------|
| - V : παύω 'stop' | - παίω 'beat' |
| - C : αὐτῶν 'self' (Gen Pl) | - αἰτῶν 'asking a favor' (Part) |
| - # : αὖ 'again' | - αἶ 'if' (Homeric) |
- c) /ai/ - /ui/
- | | |
|----------------------|--------------|
| - V : μαῖα 'midwife' | - μυῖα 'fly' |
| - # : ? | |
- d) /ai/ - /oi/
- | | |
|---------------------------|-------------------|
| - V : ? | |
| - C : καινός 'new' | - κοινός 'common' |
| - # : κακά 'bad' (Fem Pl) | - κακοί (Masc Pl) |
- e) /ai/ - /ei/
- | | |
|----------------------|---------------------------|
| - V : λαῖαι 'stones' | - λεῖαι 'smooth' (Fem Pl) |
| - # : ? | |
- f) /ei/ - /oi/
- | | |
|-----------------------------|------------------------|
| - V : εἶην 'send' (Opt Aor) | - οἶην 'such' (Acc Sg) |
|-----------------------------|------------------------|

Ionic

- # : πόλει 'city' (Dat) - πόλου 'pivots'

g) /ei/ - /ui/

- V : θεῖον 'divine' (Neuter) - θυῖον 'resin'

- # : ?

h) /ei/ - /eu/

- V : ?

- # : βασιλεῦ 'king' (Dat) - βασιλεῦ (Voc)

i) /oi/ - /ui/ ?

Long diphthongs in Classical Attic present various difficulties in phonological interpretation. So far as their origin is concerned, they were inherited from PIE in some cases (in word-final position; before a consonant they were shortened by so-called Osthoff's Law), while in other cases they resulted from Greek contractions.

Given the restrictions on the occurrence of short and long diphthongs only the following minimal pairs contrasting short and long diphthongs of identical quality are possible:

	- V	- C	- #
a) /ei/ : /ēi/	+	-	+
b) /oi/ : /ōi/	+	+	+
c) /ai/ : /āi/	+	+	+
d) /eu/ : /ēu/	-	+	-
a) /ei/ : /ēi/			

- V : εἶα 'on, up' - ἦα 'I went'

- # : (τῷ) πάθει 'accident' (Dat) - (τῇ) πᾶθῃ 'misfortune' (Dat)

- C : This contrast did not exist. Examples like εἶμεν 'that we may be' (Optative of εἶναι) versus ἦμεν 'we went' (Imperfect of ἵέναι) or εἴτε 'that you may be' versus ἦτε 'you went' are to be phonemized as /ēmen/ - /ēimen/, not /eimen/ - /ēimen/.

b) /oi/ : /ōi/

- V : οἶου 'think' (Imp) - ᾔου 'you thought' (Impf)

- # : (οἷ) λόγου 'words' (Nom) - (τῷ) λόγῳ 'the word' (Dat)

- C : οἶχου 'go' (Imp) - ᾔχου 'you went' (Impf)

Lesbian

φέρουσιν 'they carry' (Ind) - φέρουσιν (Subj)

c) /ai/ : /āi/

- V : ῥαίων 'smashing' (Part) - ῥᾶων 'easier'

- # : (αἶ) οἰκίαι 'houses' - (τῇ) οἰκίᾳ 'house' (Dat)
(Nom)

- C : ?

d) /eu/ : /ēu/

- C : εὖξασθε 'pray' (Imp) - ηὔξασθε 'you prayed' (Impf)
εὖνων 'well-disposed' - ηὔνων 'I sent to sleep'
(Gen Pl of εὖνους) (Impf of εὐνάω)

e) [āu] cannot be considered a phoneme of Attic. It results only from the contraction of *o* + *au* → *āu* (Ionic [ōu])

Attic ταὐτό(ν) [tāuto(n)] 'the same'

Ionic τωτό [tōuto]

In the case of the preposition *πρό* 'before' progressive assimilation is operative even in Attic, since otherwise the preposition would be obliterated. See the hapax *πρωῦδαν* [prōudān] 'to declare first' (Aristophanes).

Ionic

Progressive Assimilation to + auto
Contraction toouto
tōuto

Attic

	to + auto		pro + audān
<i>Regressive Assimilation</i>	taauto	<i>Progressive Assimilation</i>	prooudān
<i>Contraction</i>	tāuto	<i>Contraction</i>	prōudān

In the case of diphthongs in accented syllables the phonetic opposition short versus long can be interpreted phonologically in two ways:

- short versus long (as in the case of monophthongs) or
- a diphthong accented on the first segment (= high pitch located on the first mora) versus a diphthong accented on the second segment (= high pitch located on the second mora).

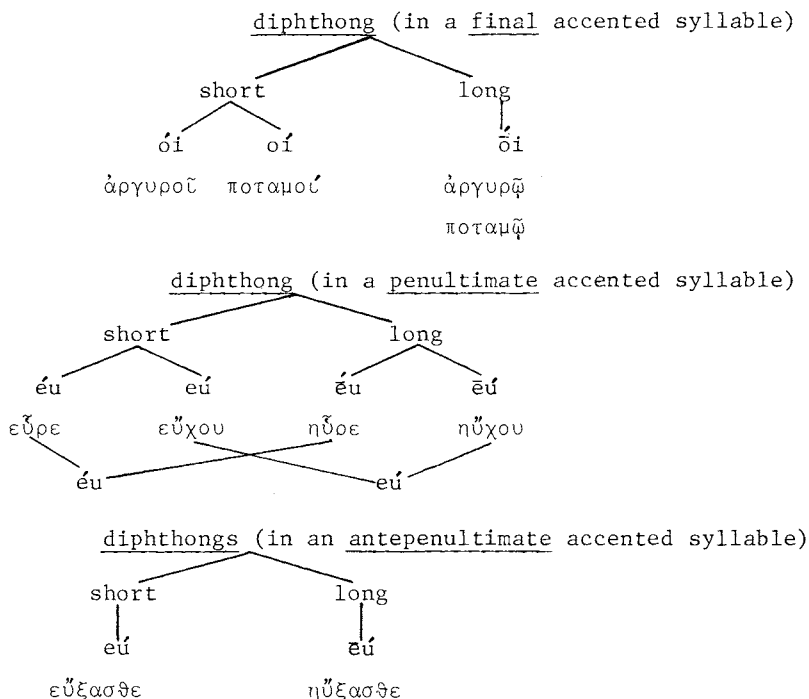
In the antepenultimate syllable only the first analysis of diphthongs is possible εὖξασθε 'pray' (Imp) vs. ηὔξασθε 'you prayed' (Aorist), i.e. short /eú/ vs. long diphthong /ēú/ with the high pitch located on the second mora. The high pitch cannot be located on the first mora, since this would breach the general rule of Greek (see 4.1, p. 133 ff).

Both analyses are possible in the case of penultimate and final accented syllables. Thus the opposition εῖρε 'find' (Imp of Aorist) vs. ηῖρε 'he found' (Aorist), or εὔχου 'pray'

(Imp) vs. $\eta\breve{\upsilon}\chi\omicron\upsilon$ 'you prayed' (Impf) can be interpreted as a short /eu/ vs. long diphthong /ēu/. Since, however, the high pitch can occur on either the first or the second mora, we can interpret this opposition as between a diphthong accented on the first segment /éu/ versus a diphthong accented on the second segment /eú/ and disregard the length of the first segment. In other words, this analysis shows that Attic in its spoken form did not exhibit the contrast short vs. long diphthong. (Imperative εὔρε and the 3rd Sg $\eta\breve{\upsilon}\rho\epsilon$ could be homophonous /héure/ without any risk of inhibiting the communication). Notice, however, that in the Middle Voice Imperative εὔροϋ and the 2nd Sg Indicative $\eta\breve{\upsilon}\rho\omicron\upsilon$ were not homophonous.

Similarly in the case of final accented syllables the opposition ἀργυροῦ 'silvern' (Pl Nom) vs. ἀργυρῶ 'to the silvern' (Dat Sg) can be interpreted as a short /oi/ vs. long diphthong /ōi/. On the other hand, the opposition ποταμοῦ 'rivers' (Pl Nom) vs. ποταμῶ (Dat Sg) may be interpreted as a diphthong accented on the second segment /oi/ vs. diphthong accented on the first segment /ói/.

Figure 2-10. Short and long diphthongs in accented syllables.



According to Allen (1974:80) long diphthongs in the environment before a vowel are to be evaluated not as diphthongs but simply as sequences of long vowel + palatal or velar glide, thus /āi/ = /ā/ + /j/. Consequently, the above minimal pairs would not be nominal pairs:

ῥᾱῖων/rāiōn/ vs. ῥαῖων/raiōn/ would not be analyzed as /āi/ versus /ai/ but as /rājōn/ vs. /rajōn/.

This seems only to be a notational variant of the preceding solution. It implies a different syllabification in that the first word is to be segmented with the high front segment in the second syllable: *rā* - *jōn* as compared with the second with the high front element in the first syllable: *rai* - *jōn*. In the case of external sandhi (when a final long diphthong is followed by an initial vowel) we may assume the loss of the morpheme boundary, e.g. τῶ ὄρνιθι/tō + jōrnithi/ 'to the bird'. Allen cites spelling habits as evidence for this kind of analysis, e.g. Ionic τῇ Ἀφροδίτῃ 'to Aphrodite' where the prevocalic palatal glide /j/ is omitted, since it was automatic in the environment after a front vowel. In the environment after a back vowel, as in our case, we may hypothesize that the palatal glide was optional - there could be speakers who would realize the above phrase as *tō + ornithi* with hiatus. In other words, long diphthongs in prevocalic position cannot be considered as full fledged phonemes, since they prove to be unstable, their second component can be lost or separated by syllabic boundary:

/tōi + órnithi/	/tōi + patrí/
[tōjórñithi]	[tōjpatri]
or [tōórnithi]	[tōpatri]

Their phonemic status could be saved in terms of more abstract phonology, where morphological considerations bear on phonological phenomena. Thus the representation /rāi-ōn/ versus /rai-ōn/ would be supported by evidence that speakers of Attic were aware of the morphemic boundary in ῥᾱῖων (-ων is a suffix of other comparatives). Following this, it would seem that some speakers did have the contrast /āi/ versus /ai/, depending of course on their having palatal glide in the environment between back vowels. On the other hand, there were speakers without the palatal glide for whom all the above forms could be pronounced with hiatus:

[ῥāōn] versus [raiōn]
 [tē + ap^hroditē]

We are on firmer ground in the environment before a

consonant or pause, where it is safer to assume that long diphthongs have a phonemic status. However, even in cases like /éuksast^{he}/ versus /éuksast^{he}/, /lógoi/ versus /lógoi/, we may wonder about the stability of the opposition between short and long diphthongs (manifested phonetically as the opposition between 'normal' and 'delayed' glide). In fact, we expect such a marked opposition to be unstable unless supported by concomitant quality differences.³ There are independent reasons to think that this contrast was an orthographic artifact. Colloquial Attic could certainly tolerate homophony of the above forms - the homonymic clash between the Aorist Imperative /éuksast^{he}/ [éuksast^{he}] and Aorist Indicative /éuksast^{he}/ [éuksast^{he}] was certainly no major problem in oral communication. There was, as a matter of fact, no homonymic convergence of τῷ λόγῳ and οἱ λόγῳ, in the case when the Dat Sg and Nom Pl were used with an article. Of equal importance, other dialects (e.g. Arcadian) fail to show the opposition at all: τοῖ λογοῖ /toi logoi/ is both Nom Pl and Dat Sg.

2.3 MONOPHTHONGIZATION OF PROTO-GREEK DIPHTHONGS

*ei and *ou

The dates proposed for the introduction of this process vary from the 7th to the 5th c. according to different scholars. Bartoněk (1966:77) is sure that monophthongization of both these diphthongs occurred prior to 650 B.C. Schwyzler (1938:233) dates this change as late as the 5th c. B.C. A piece of direct evidence for the early date is that the earliest known Attic inscription (ca. 725 B.C.) shows the form τῶτον = τοῦτον which might indicate that the monophthongization of the diphthong /ou/ into /ō/ was under way as early as the end of the 8th c. B.C. In terms of relative chronology Bartoněk (1966:118) suggests that in Attica, Ionia and the Cyclades the diphthongs /ei/ and /ou/ were monophthongized into /ē/ and /ō/ either *prior* to the fronting process /ū/ → /ü/ or *simultaneously* with it.

In my view, the earlier estimate for the monophthongization should be discarded in favour of the 5th c. for a number of reasons. Reexamination of data in Meisterhans-Schwyzler (1900:20,26,63) shows that documents belonging to the 5th c. still make the distinction between

/ei/ spelled EI,	and /ē/ spelled E
/ou/ spelled OY	/ō/ spelled O

The following confusions in spelling may prove that the monophthongization /ei/ → /ē/ and /ou/ → /ō/ took place in pre-consonantal position before the 5th c. B.C.

κῆμα	(IG I ² 1078 etc.)	vs.	εἰμί	(ibid. 1001, etc.)
τότον	Gen Pl of οὗτος		βουλεῖ	(ibid. 115,3)
	(IG I ² 247, etc.)			

In the environment before the vowels, the inscriptions of the 5th and 4th c. hesitate between spellings *EI* and *E* e.g. *ἡέρεια* and *ἡέρεα*, *Πελευῖται* and *Πελεῖται* etc. This seems to indicate that the diphthong /ei/ was not monophthongized before the vowels /a, e, o/ in the 5th and 4th c. It is hard to tell when the diphthong /ou/ in the environment before vowel was monophthongized since Attic inscriptions do not show alternative spellings *OY* and *O* (as in the case of *EI* and *E*).⁴

Further evidence for the delayed monophthongization of /ei/ before vowels, according to Allen (1974:79), can be derived from the fact that the long close mid front vowel /ē/ was slower to develop to a close /ī/ in a prevocalic than a preconsonantal (or prepausal) position. This delay is taken to be the result of the delayed monophthongization of a prevocalic /ei/ in earlier times.

Thus in terms of relative-absolute chronology of sound-change we can tabulate these developments as in Figure 2-11.

Figure 2-11. Monophthongization of the diphthong *ei* [after Allen (1974:74)].

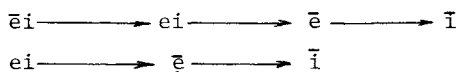
	pre- 5th c.	5-4th c.	4-3rd c. B.C.	1st-2nd A.D.	2-3rd A.D.
preconson- antal /ei/	ē		ī		
prevocalic /ei/	ei	ē		ī	
/ē/				ē	ī
/ai/				ē	

[Reproduced by kind permission of the Cambridge University Press]

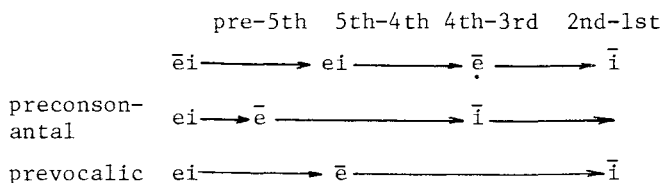
The monophthongal development *ai* → *ē* in Boeotian preceded the same development in Hellenistic Koine by several centuries. At the end of the 4th c. we already find spellings like *Ταναγρηῶ* [tanagrēō] 'of Tanagra' (Attic *Ταναγραίου* [tanagraiū]), *Θειβηῶ* [thēbēō] 'Theban' (Attic *Θηβαίου* [thēbaiū]). As the latter example shows, even the raising *ē* → *ī* took place much earlier in Boeotian.

Furthermore, we can venture a hypothesis that by the early 4th c. the long diphthong /ēi/, which was optionally realized as a short diphthong [ei], underwent in its turn the monophthongization process that earlier affected the short diphthong

/ei/. This hypothesis is supported by the tendency in the 4th c. to replace *HI* /ēi/ by *EI* /ei/, e.g. ἀποκλήω ~ ἀποκλέω 'shut out', κλῆς ~ κλεῦς 'key', κληῖθρον ~ κλεῖθρον 'bolt', λητουργῶ ~ λειτουργῶ 'perform public duties'. According to Lupaş (1972:35) there is no evidence for these spelling alterations before the 5th c. The above facts support the following relative chronology:

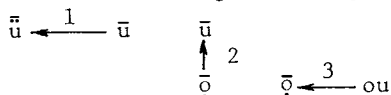


Adding the absolute dimension, we posit the relationships below:

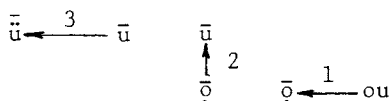


Notice that / $\bar{e}$ / (from $*\bar{e}i$) was raised to / $\bar{i}$ / in Roman times (2nd - 1st B.C.). Its development was later than the raising of / $\bar{e}$ / (from $*ei$), which dates from the 4th - 3rd B.C.

It is hopeless to attempt to specify the relative chronology of monophthongization by establishing a causal nexus between this change and the fronting of $\bar{u}$ ($\longrightarrow \bar{y}$) and the raising of half-close back $\bar{o}$ ($\longrightarrow \bar{u}$). Thus if we accept the old view that the fronting of $\bar{u}$ ($\longrightarrow \bar{y}$) took place quite early - in the 7th c. according to Schwyzer (1938:233) and monophthongization followed in the 6 - 5th c. - we would have a plausible case for a drag-chain explanation:



If on the other hand the monophthongization preceded the fronting, it undoubtedly preceded also the raising. Bartoněk (1966:127) suggested that the change $\bar{o} \longrightarrow \bar{u}$ was fully accomplished as late as 400 B.C. In this case a push chain is motivated:



The corresponding evolution of the front vowels can be used to further illuminate the push/drag-chain question. Consider the following data:

	λείπω	βουλῆ	βουλῆς	καιρός	θυμός
<u>Classical Attic</u> (5th B.C.)	lēpō	bōlēi	bōlē's	kairós	t ^h ūmós
4th - 3rd B.C.	līpō	būlē	būlē's		t ^h ūmós
2nd - 1st B.C.		būlī			
1st - 2nd A.D.			būlē's	kērós	
2nd - 3rd A.D.			būlīs	kērós	
⋮					
⋮					
⋮					

<u>Modern Greek</u>	lípo	(vulí)	vulís	k'erós	thimós
---------------------	------	--------	-------	--------	--------

It is of interest that the raising of preconsonantal $\bar{e} \rightarrow \bar{i}$, which was under way during the 4th - 3rd c. in Attic, took place much earlier in neighbouring Boeotian. This is obvious from the observation that the spellings which vary between *EI* and *I* in the 5th c. later occur as invariant *I*, when the Boeotians adopted the Ionic alphabet around 350 B.C.:

<u>Boeotian</u>	εχῦ	/ek ^h i/	'have'	<u>Attic</u>	ἔχει	/ek ^h ē/
	επιδέει	/epīdē/	'when, since'		ἐπειδή	/epēdē/
	κείμενας	/kīmenās/	'laid'		κειμένας	/kēmenās/

The raising of half-close midvowels took place everywhere during the Hellenistic and Graeco-Roman period. It is possible that this phenomenon represents a contribution of Boeotian to Hellenistic Koine in the sense that the change may have started here, later on appeared in Attic, and still later spread to insular Ionic. We know that the raising of / $\bar{o}$ / never operated in West Ionic (= Euboean) and there is some evidence for delayed raising of / $\bar{e}$ /. This is established on the basis of words spelled with *EI* / $\bar{e}$ / in Ionic inscriptions which already exhibit *I* / $\bar{i}$ / in Attic. Consider also the Doric equivalents:

<u>Laconian</u>	χηλίου	'thousand'	<u>Cretan</u>	βωλα	'counsel'
<u>Ionic</u>	χεύλιου		<u>West Ionic</u>	βουλῆ	/bōlē/
<u>Attic</u>	χῦλιου		<u>Attic-Ionic</u>	βουλῆ	/būlē/
<u>Theran</u>		μηλυχλος	'mild, gracious'		
<u>Attic-Ionic</u>		μελύχλος			
<u>Attic</u> (inscriptions)		μῦλχλος			
<u>Cretan</u>	Φημα	'dress'			

Ionic εἶμα, εἰμάτιον

Attic ἱμάτιον

With its two raisings, Attic is the most progressive of these three groups.⁵ Ionic dialects with one raising on the front axis (and one or two on the back axis) occupy the middle position between Attic and the conservative 'strict' Doric dialects, which did not raise mid vowels at all. In summary, the sequence of sound-changes from Proto-Greek can be reconstructed as below:

	k ^h eslioi	bolsā	
<i>Fricative Weakening</i>	k ^h ehlioi	-	
<i>Compensatory Lengthening</i>	k ^h ēlioi	bōlā	<u>Doric</u>
<i>Fronting</i>	-	bōlā̃	
<i>Raising</i>	k ^h ē̃lioi	bōlē̃	<u>West Ionic</u>
<i>Raising</i>	k ^h īlioi	būlē̃	<u>Ionic</u>

2.4 FRONTING AND RAISING OF PROTO-GREEK *ā IN ATTIC-IONIC

Proto-Greek *ā remains unchanged in all dialects with the exception of Attic-Ionic where ā was fronted (ā → æ̃) and subsequently raised (æ̃ → ē̃):

<u>Attic-Ionic</u>	<u>other dialects</u>
τιμῆ 'honor'	τιμᾶ
φημί 'I say'	φᾶμι

However, even Attic differs from the rest of Ionic dialects in not having ē̃ but ā after front vowels e, i and liquid r e.g.

<u>Attic</u>	<u>Ionic</u>
γενεᾶ 'family'	γενεῆ
οἰκία 'house'	οἰκίη
χώρα 'county'	χώραη

Two theories have been elaborated to explain this distribution of reflexes in the Attic-Ionic group of dialects. The first posits a continuous line of development while the second proposes a retrogressive stage:

1) Attic retained the Proto-Greek ā after front vowels and r while Ionic fronted ā to æ̃ in all environments.

Proto-Greek *ā → Attic ā (but not after front vowels or /r/)

*ā → Ionic æ̃

2) Attic-Ionic changed Proto-Greek ā into æ̃ and then Attic changed æ̃ back into ā after front vowels and r:

Proto-Greek *ā → Attic-Ionic $\bar{a}$
 (later) Attic $\bar{a}$ → $\bar{a}/\left\{\begin{smallmatrix} \text{front vowel} \\ r \end{smallmatrix}\right\}$ -

The problem is further complicated by the fact that some Attic words show ξ after r , e.g. κόρη 'girl', δέρη 'neck'. In many of these cases r was originally followed by w ; consequently, the rule could be formulated for them. Unfortunately, examples like εἰρήνη 'peace' or κρήνη 'source' (from Proto-Greek *eirānā, *krānā; cf. Doric ἱρανᾶ, κρανᾶ) cannot be explained in such a way. The retrogressive theory has tended to be dominant in the linguistic literature. Szemerényi for example (1968:139-157) gives the following account in terms of relative-absolute chronology of historical sound change:

Stage 1: About 1000 - 950 B.C. Proto-Greek $\bar{a}$ was narrowed into $\bar{a}$ in the Ionic group of dialects. Loss of intervocalic w took place about the same time. The loss was complete in East Ionic, but incomplete in West Ionic (= Attic and Euboic):

	*newā	*hāmerā	*korwā
$\bar{a} \longrightarrow \bar{a}$	new $\bar{a}$	hāmer $\bar{a}$	korw $\bar{a}$
$w \longrightarrow \emptyset/V-V$	ne $\bar{a}$		

Stage 2: About 800 B.C. a 'new' long velar $\bar{a}$ was introduced into the system of long vowels. This $\bar{a}$ arose by the second compensatory lengthening (see p. 59): *pantja → pansa → pāsa. This innovation coincided with the reopening of the $\bar{a}$ to $\bar{a}$ in the environment after front vowels and r :

	*newā	*hāmerā
$\bar{a} \longrightarrow \bar{a}$	new $\bar{a}$	hāmer $\bar{a}$
$w \longrightarrow \emptyset/V-V$	ne $\bar{a}$	-
$\bar{a} \longrightarrow \bar{a}/\left\{\begin{smallmatrix} \text{front vowel} \\ r \end{smallmatrix}\right\}$ -	neā	hāmerā

Stage 3: About 750 B.C. the opening influence of the r ceased to operate but the opening influence of the front vowels continued. At the same time, post-consonantal w was lost in West Ionic. This would have created a new r before $\bar{a}$ which would be expected to condition $\bar{a} \longrightarrow \bar{a}$. By this time, however, r no longer conditioned the backing of $\bar{a}$:

	*newā	*korwā
$\bar{a} \longrightarrow \bar{a}$	new $\bar{a}$	korw $\bar{a}$
$w \longrightarrow \emptyset/V-V$	ne $\bar{a}$	-
$w \longrightarrow \emptyset/r-$	-	kor $\bar{a}$
$\bar{a} \longrightarrow \bar{a}/\text{front vowel}-$	neā	-

Meanwhile the vocalic sequence *ea* (from Proto-Greek **esa* → *ēha* → *ea*) was contracted into the long front low vowel $\bar{e}$ which remained unchanged even after *r*; however, the $\bar{e}$ segments from this source become $\bar{a}$ after front vowels (while not changing after *r*):

	<i>*genesā</i>	<i>*oresā</i>	<i>*endewesā</i>
	·	·	·
	·	·	·
	·	·	·
	genea	orea	endeeā
<i>contraction</i>	gen $\bar{e}$	or $\bar{e}$	ende $\bar{e}$
$\bar{e} \longrightarrow \bar{a}/\text{front vowel} -$	-	-	ende $\bar{a}$

In other words, Szemerényi argues that the retrogression of $\bar{e} \longrightarrow \bar{a}$ of West Ionic was simplified in the following way:

- (1) about 800 B.C. $\bar{e} \longrightarrow \bar{a}/\left\{\begin{array}{l} \text{front vowel} \\ r \end{array}\right\} -$
- (2) about 750 B.C. $\bar{e} \longrightarrow \bar{a}/\text{front vowel} -$

This would seem to be the weak part of Szemerényi's refinement of the relative scheme of the Attic 'Rückverwandlung' - for what reason should the opening influence of the /*r*/ cease after such a short time span?

Lejeune's theory (1972:234-6) is basically the same. According to him the narrowing ('fermeture') of $\bar{a}$ into $\bar{e}$ took place before the time of the second compensatory lengthening (restricted to the secondary consonantal group *-ns-*, see p. 59, **pantja* → *pansa* → *pāsa*). It also preceded the contraction of *a + e* → $\bar{a}$ (e.g. $\tau\upsilon\mu\acute{\alpha}\epsilon\tau\epsilon \rightarrow \tau\upsilon\mu\bar{\alpha}\epsilon\tau\epsilon$), since the resulting $\bar{a}$ remained unchanged in both Attic and Ionic dialects. The Attic-Ionic $\bar{e}$ continued to close in articulatory height until it merged with the Proto-Greek $\bar{e}$. However, $\bar{e}$ and $\bar{e}$ still had not merged in 6th c. Cycladic (in Ionic dialects spoken on the islands of Amorgos, Naxos and Ceos). The difference in local alphabets indicates this: the grapheme *H* denotes the new $\bar{e}$ while the grapheme *E* denotes the Proto-Greek $\bar{e}$. Before the fusion of the new $\bar{e}$ and the Proto-Greek $\bar{e}$ was complete, conditioned reopening of the $\bar{e}$ took place twice in Attic.

Lejeune also presents relative chronology of sound-change. According to him, the first reopening took place in the environment after *r* but desisted at the time of the contraction of *e + a* due to the merger of the resulting $\bar{e}$ with the Proto-Greek $\bar{e}$ e.g. the Acc Sg **πλήρεα* → *πλήρη*. This reopening dates from before the loss of postconsonantal *w* as well as the assimilation of the type *rs* → *rr*, namely Attic *κόρη* 'girl' (**korwā*), *κόρη* 'temple' (< **korsā*).

The second reopening took place later. During the second reopening the $\bar{e}$ reopened after front vowels, e.g. Attic *γενεά*

Ionic γενή, Attic καρδιά 'heart', Ionic καρδίη. The second reopening must have followed the loss of intervocalic *w* and the contraction of *e + a* since the resulting $\bar{ae}$ reopens back to $\bar{a}$ in the Acc Sg *ἐνδεέα $\longrightarrow$ ἐνδεᾶ. The table below illustrates the relative sequence of historical sound-changes according to Lejeune's theory:

1st reopening

		*plēresa ⋮		
	*hāmerā	*plērea	*korwā	*korsā
$\bar{a} \longrightarrow \bar{ae}$	hāmerāe	-	korwāe	korsāe
$\bar{ae} \longrightarrow \bar{a}/r$ -	hāmera	-	-	-
$e + a \longrightarrow \bar{ae}$	-	plērāe	-	-
$w \longrightarrow \emptyset/r$ -	-	-	korāe	-
$s \longrightarrow r/r$ -	-	-	-	korrāe

2nd reopening

			*endevesa ⋮	
		*genea	*newā	endeeā
$\bar{a} \longrightarrow \bar{ae}$		geneāe	newāe	-
$w \longrightarrow \emptyset/V - V$		-	neāe	-
$e + a \longrightarrow \bar{ae}$		-	-	endeāe
$\bar{ae} \longrightarrow \bar{a}/\text{front vowel}$ -		geneā	neā	endeā

Lejeune's presentation of the Attic 'Rückverwandlung' involves two difficulties. The first one is essentially the same as the one found in Szemerényi's account; i.e. for some unspecified reasons the 'opening influence' of *r* historically precedes the opening influence of front vowels. The second one becomes obvious if we juxtapose the derivational history of κόρη and νέᾱ:

	*korwā		*newā
$\bar{a} \longrightarrow \bar{ae}$	korwāe		newāe
$\bar{ae} \longrightarrow \bar{a}/r$ -	-	$w \longrightarrow \emptyset / V - V$	neāe
$w \longrightarrow \emptyset/r$ -	korāe	$\bar{ae} \longrightarrow \bar{a}/\text{front vowel}$ -	neā

Lejeune's version of the regressive hypothesis is rather farfetched. The reopening rule is allowed to apply twice -

once *before* the loss of postconsonantal *w* and again *after* the loss of intervocalic *w*. However, these two rules can be easily collapsed:

$$\bar{a} \longrightarrow \bar{a} / \left\{ \begin{array}{l} \text{front vowel} \\ r \end{array} \right\} -$$

Of course still another rule would be necessary to derive forms like ἐνδεᾶ:

$$\bar{a} \longrightarrow \bar{a} / \text{ front vowel } -$$

Again we are left to ponder why the opening influence of the *r* ceased to operate.

These difficulties are obviated in the older progressive theory according to which there was no reopening of the $\bar{a}$ to $\bar{a}$. From this point of view Attic retained Proto-Greek $*\bar{a}$, unchanged after front vowels and *r*, while Ionic fronted $\bar{a} \longrightarrow \bar{a}$ without constraints of environment. As noted by Schwyzer (1938:188) this theory is simpler and more straightforward. The retrogressive and progressive theory both contain a basic assumption that the loss of intervocalic *w* precedes the loss of postconsonantal *w*. In the progressive theory the restricted fronting (Attic) and unrestricted fronting (Ionic) of the Proto-Greek $*\bar{a}$ are ordered together between these two losses. This is clear from the following derivations:

	<u>Attic</u>	
	*korwā	*newā
$w \longrightarrow \emptyset / V - V$	-	neā
<i>Fronting</i>	korwā̃	-
$w \longrightarrow \emptyset / r -$	korā̃	-

	<u>Ionic</u>	
	*korwā	*newā
$w \longrightarrow \emptyset / V - V$	-	neā
<i>Fronting</i>	korwā̃	neā̃
$w \longrightarrow \emptyset / r -$	kōrā̃	-

According to this theory the previous words would be derived as follows:

	<u>Attic</u>			
	*hāmerā	*korwā	*geneā	*newā
$w \longrightarrow \emptyset / V - V$	-	-	-	neā

(restricted)	hāmerā	korwā	-	-
Fronting				
w → ∅ / r -	-	korā	-	-

Raising	hēmerā	korē	-	-
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Ionic

w → ∅ / V - V	-	-	-	neā
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Fronting	hāmerā	korwā	geneā	neā
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w → ∅ / r -	-	kōrā	-	-
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+ Compensatory
Lengthening

Raising	hēmerē	kōrē	geneē	neē
---------	--------	------	-------	-----

It can be seen in the derivational history of contracted forms like Attic πλήρη, ὑγῖα or ὑγῖη (in Plato) and ἐνδεᾶ (Neuter or Acc Masc of the adjectives πλήρης 'full', ὑγίης 'healthy', ἐνδεής 'lacking') that the source of the hypothesis about reopening of $\bar{e}$ back to $\bar{a}$ was only regressive

assimilation of e to a in sequences $\begin{Bmatrix} u \\ i \\ e \end{Bmatrix} ea \rightarrow \begin{Bmatrix} u \\ i \\ e \end{Bmatrix} aa$.

The existence of a *regressive* assimilation is further supported by the existence of other forms requiring a *progressive* assimilation. Furthermore, forms like ὑγῖη (~ ὑγῖα) could not be explained by the reopening hypothesis alone and would stand as exceptions. Such forms can, however, be derived easily if progressive and regressive assimilation are both posited:

	plēresa	hugiésa	
Fricative Weakening	plēreha	hugiéha	
$h \rightarrow \phi / V - V$	plērea	hugiéa	<u>Ionic</u> (uncontracted)
Progressive Assimilation	plēree	hugiée	
Contraction	plērē	hugiê	<u>Attic</u>
	endewésa	hugiésa	
Fricative Weakening	endewéha	hugiéha	
$h \rightarrow \phi / V - V$	endewéa	hugiéa	
$w \rightarrow \phi / V - V$	endeéa	-	
Regressive Assimilation	endeśa	hugiáa	
Contraction	endeâ	hugiâ	<u>Attic-Ionic</u>

In these derivations a certain inconvenience appears in the representation *plēree*, *hugiēe* at the stage after progressive assimilation, since the output of isovocalic contraction is regularly a raised vowel in Attic-Ionic: $e + e \longrightarrow \text{ē}$. Since the vowel resulting from the contraction is low, if one of the contracting vowels is low, a more appropriate notation before the contraction would be *plēreæ*, *hugiēæ*, *endeæʔa*. Independent support is afforded by Ionic where it is known that long vowels developed in parallel fashion.

	<u>Ionic</u>	<u>Attic</u>
	-eā	-ea
<i>Fronting</i>	-e $\overline{a}$ <i>Progressive Assimilation</i>	-eæ
<i>Raising</i>	-e $\overline{\text{ē}}$ <i>Contraction</i>	- $\overline{\text{ē}}$

Here we should note the derivation of some more complicated forms belonging to εὐκλεής 'famous':

Acc Sg	εὐκλ(ε)έα	Acc Pl	εὐκλ(ε)έας
	εὐκλεᾶ (Pindar)		ἐϋκλεῖας (Homeric)
	εὐκλεῖα(poetic)		εὐκλεεῦς

Uncontracted forms

	ewésa	ewésas
<i>Fricative Weakening</i>	ewéha	ewéhas
$h \longrightarrow \emptyset / V - V$	ewé a	ewé as
$w \longrightarrow \emptyset / V - V$	e é a εὐκλεέα	e é as εὐκλεέας
<i>Syncopation</i>	é a εὐκλέα	é as εὐκλέας

Contracted forms

	⋮		⋮
	e é a		e é as
<i>Contraction (e + e)</i>	ē a εὐκλεῖα (reaccented)	ē as ἐϋκλεῖας (reaccented)	
	ésa	ewéses	ewésa
<i>Fricative Weakening</i>	éha	ewéhes	ewéha
$h \longrightarrow \emptyset / V - V$	é a	ewé es	ewé a
$w \longrightarrow \emptyset / V - V$	-	e é es	e é a
<i>Progressive Assimilation</i>	ē ē	-	<i>Regressive Assimilation</i> e á a

<i>Contraction</i> (<i>é + e</i>)	$\hat{e}$ ψευδῆ	<i>Contraction</i> (<i>â + a</i>)	$e \hat{a}$ εὐκλεεῦς
			εὐκλεᾶ

Let us recapitulate the most essential part of the previous discussion. In different dialects it is common for some sound-changes to occur at different times. In the case of the Ionic group of dialects the loss of postconsonantal *w* and fronting of $\bar{a}$ ($\rightarrow \bar{æ}$) occurred earlier in (East) Ionic than in Attic. Thus if we want our rules to imitate the sequential character of historical sound-changes the derivational scheme should look as follows:

	<u>Attic</u>	<u>Ionic</u>
	*korwā	*korwā
<i>Fronting</i>	-	korwā
<i>w</i> $\rightarrow$ $\emptyset$ / <i>r</i> -	-	kōrā
+ <i>Compensatory Lengthening</i>	-	kōrā̄
<i>Fronting</i>	korwā̄	-
<i>w</i> $\rightarrow$ $\emptyset$ / <i>r</i> -	korā̄	-
<i>Raising</i>	korē̄	kōrē̄

In Attic the loss of postconsonantal *w* followed the fronting process. In Ionic, however, the ordering is irrelevant since for either order the result will be the same. The following derivation illustrates the ordering of the loss of *w* and compensatory lengthening before fronting:

	<u>Attic</u>	<u>Ionic</u>
	*korwā	*korwā
<i>w</i> $\rightarrow$ $\emptyset$ / <i>r</i> -	-	kōrā
+ <i>Compensatory Lengthening</i>	-	kōrā̄
<i>Fronting</i>	korwā̄	kōrā̄
<i>w</i> $\rightarrow$ $\emptyset$ / <i>r</i> -	korā̄	-
<i>Raising</i>	korē̄	kōrē̄

2.5 COMPENSATORY LENGTHENING

2.5.1. First Compensatory Lengthening

In the majority of Greek dialects, with the exception of the Aeolic group (Thessalian and Lesbian), Proto-Greek consonant clusters of a sibilant followed by liquid, nasal or velar semivowel (*sr, *sl, *sm, *sn, *sw) were affected by the fricative weakening *s* $\rightarrow$ *h*. By this change the Proto-Greek *s inherited from PIE lost its typical articulation of

a dental sibilant and changed into a voiceless glottal fricative *h*. The voiceless glottal fricative *h* was subsequently lost and this loss was accompanied by the *first compensatory lengthening* of the preceding short vowel:

	V	s	Sonorant
<i>Fricative Weakening</i>	V	h	Sonorant
<i>Compensatory Lengthening</i>	$\bar{V}$		Sonorant

Doric σελαῖνᾱ 'moon' and χηλιοι 'thousand' from Proto-Greek *selasnā and *kheslioi exemplify these processes:

	selasnā	kheslioi
<i>Fricative Weakening</i>	selahnā	khehlioi
<i>Compensatory Lengthening</i>	selānā	khēlioi

In the same dialects Proto-Greek consonantal clusters of a sibilant following liquid or nasal (*rs, *ls, *ms, *ns) were simplified by the loss of the sibilant. This loss was accompanied by the compensatory lengthening of the preceding short vowel. In this case, however, the environment for compensatory lengthening is extremely limited since it occurs only in the sigmatic Aorist (see p. 122).

In the same dialects the Proto-Greek consonant cluster was simplified by the loss of the nasal, accompanied by the compensatory lengthening of the preceding short vowel.

The derivation of Doric ἐφᾱνα 'I showed' and στᾱλᾱ 'stela' from the Proto-Greek *ephansa and *stalnā illustrate this:

	ephansa		stalnā
<i>s - Loss</i>		<i>n - Loss</i>	
<i>+ Lengthening</i>	ephāna	<i>+ Lengthening</i>	stālā

The traditional label *first compensatory lengthening* lumps together under the same heading the compensation for three distinct types of loss:

- the loss of a glottal fricative before sonorants:
h → Ø/ - Sonorant
- the loss of a sibilant after sonorants (limited to the sigmatic Aorist):
s → Ø/ Sonorant - V
- the loss of a dental nasal after lateral liquid:
n → Ø/ l - V

Linguists usually place the first compensatory lengthening around 1000 B.C. since the product of this lengthening (long /ā/) was subject to the fronting /ā/ → /æ/, which in its turn is supposed to have taken place *later* in the Attic-Ionic group.

The suggested date for Attic-Ionic fronting varies from

ca 1000 - 700 B.C. The end of the 8th c. B.C. is the time of the earliest Attic-Ionic inscriptions. At this time raising of the low front vowel into a middle one /æ/ → /ē/ is already documented, and this depends, of course, on the existence of æ (< ᾶ). Schwyzler (1938:233) places the boundary between the 8th and 7th c. Lejeune (1947:17) includes fronting in the set of changes taking place 'towards the end of the 2nd and in the beginning of the 1st millenium. Risch (1955:65) suggests the 10th or the 9th c. Bartoněk (1966:101) prefers circa 900 B.C., the terminus post being 10th c. and the terminus ante 800 B.C. In terms of relative chronology, Lejeune and Bartoněk argue that fronting ceased to be active before the second compensatory lengthening. According to Lejeune (1972:235)

la fermeture avait cessé de se produire avant l'époque des allongments compensatoires récents (*πανσανς > πᾶσας) et des contractions de ᾶ avec Ί (*τῠμάετε > τῠμάτε), Ί̄ (τῠμάειν > τῠμᾶν) ou ε̄ (*τῠμάητε > τῠμάτε); les ᾶ qui en résultent ont subsisté en ionien et en attique, ainsi que les ᾶ des mots d'emprunt postérieurs (Dārayavahuš: Ἀρεῦχος).

Similarly Bartoněk (1966:101) places Attic-Ionic fronting *between* the operation of the 1st and the 2nd compensatory lengthening:

<u>Absolute-relative</u>		<u>chronology</u>		*pántja
				.
			*ép ^h ansa	.
1000 B.C.	1st Compensatory Lengthening	ép ^h āna		.
900 B.C.	Fronting	ép ^h āna		pānsa
800 B.C.	Raising	ép ^h ēna	2nd Compensatory Lengthening	pāsa

Notice, however, that these facts can be explained without reference to the suggested relative chronology. It might be proposed that the fronting of ā → æ failed to apply in *pāsa* not because 'la fermeture avait cessé de se produire avant l'époque des allongements compensatoires' but simply because, if it did, the resulting paradigm would show morphemic variation like: *πῆς, παντός instead of πᾶς, παντός. In other words, even if fronting had applied here its result might have been levelled by analogy with other members of the paradigm. Consequently, I would tend to believe that the fronting did not apply inside of the paradigm of πᾶς, παντός. To say that the fronting rule ceased to operate before 'l'époque

des contractions' /a/ + /e/ → /ā/ involves other difficulties - a result of the same contraction in Doric is /ē/ and Doric did not front the low vowel /ā/. Thus against Attic ἔφηναι, τῆματε there is Doric ἔφᾱναι, τῆμητε:

	<u>Attic</u>		<u>Doric</u>	
	éphāna		éphāna	
<i>Fronting</i>	éphāna	tīmāete	-	tīmāete
<i>Raising</i>	éphēna	-	-	-
<i>Contraction</i>		tīmāte		tīmēte

2.5.2 Second and Third Compensatory Lengthening

Some linguists distinguish between a 2nd and a 3rd compensatory lengthening. Both of these lengthenings presumably took place after the Attic-Ionic fronting $\bar{a} \longrightarrow \bar{e}$. The second lengthening of the type ($*pantja \longrightarrow$) $pansa \longrightarrow pāsa$ became a source of a new Attic-Ionic /ā/, where the Proto-Greek $*a$ had been fronted several generations ago. The 2nd lengthening follows a fairly general tendency in Greek to weaken a nasal before a sibilant. The environment of the 2nd lengthening includes:

- the secondary medial cluster $-ns-$ derived from Proto-Greek $*-ntj/i-$ (through affrication and depalatalization)
- the primary final $*-ns$ (in the Acc Pl, $*tons$ Attic τοὺς, Laconian τως).

The 2nd lengthening did not extend to certain 'peripheral' dialects: Thessalian, Arcadian, West Argolic, Central Cretan, where forms like πανσα and φερωνσα are found. In Lesbian, Cyrenaean (and also apparently in Thera) the palatal glide metathesized with the cluster ns or with s depending on whether the loss of n preceded or followed metathesis, and the form of the 3rd Pl $-onsi$ (< $*-onti$) underwent 'metathesis (b)' $-onsi \longrightarrow -oinsi$ (defined on p. 189):

Lesbian and Cyrenaean

	pheronti	pherontja	pantja
<i>Affrication</i>	pheront ^s i	pheront ^s ja	pant ^s ja
$t \longrightarrow \emptyset$	pheronsi	pheronsja	pansja
<i>Metathesis of glide</i>	pheroinsi	pheroinsa	painsa
$n \longrightarrow \emptyset$	pheroisi	pheroisa	paisa (also <u>Theran</u>)

'peripheral' dialects (Thessalian, Arcadian, West Argolic, Central Cretan)

: : :

	p ^h eronsi	p ^h eronsja	pansja
	(Arcadian)		
Depalatalization	-	p ^h eronsa	pansa
n → ∅	-	-	-
'peripheral' dialects (<u>Theran</u> , <u>Laconian</u> , <u>Messenian</u> , <u>Elean</u>)			

	⋮	⋮	⋮
	p ^h eronsi	p ^h eronsja	pansja
Depalatalization	-	p ^h eronsa	pansa
n → ∅			
+ 2nd Lengthening	p ^h erōsi	p ^h erōsa	pāsa

Remaining dialects

	⋮	⋮	⋮
	p ^h eronsi	p ^h eronsja	pansja
Depalatalization	-	p ^h eronsa	pansa
n → ∅			
+ 2nd Lengthening	p ^h erōsi	p ^h erōsa	pāsa
Raising	p ^h erō̄si	p ^h erō̄sa	-

The 3rd lengthening is limited to the clusters $\left\{ \begin{array}{l} \text{Nasal} \\ \text{Liquid} \end{array} \right\} +$ Velar glide (**nw*, **rw*, **lw* - notice that the cluster **sw* meets the structural description of the 1st lengthening). The effect of this process is to compensate for the loss of *w* after sonorants by lengthening the preceding vowel. It was active in Ionic outside Attic and West Ionic (= Euboean), in Argive (= the dialect of Argos) but not in Argolic, Cretan, Cyrenaean and East Aegean Doric. According to Bartoněk (1966:69) this process represented only a minor isogloss comprising the central and south-eastern sector of the Aegean region. Elsewhere *w* is lost following sonorants without a corresponding effect on the preceding vowel:

	*korwā	*derwā	*ksenwos
<u>Arcadian</u>	κορFα 'girl'	δερFα 'neck'	ξένος 'guest'
<u>Attic</u>	κόρη	δέρᾱ	ξένος
<u>Lesbian</u> (literary)	κόρᾱ	δεῖρη	ξένος
<u>Ionic</u>	κούρη		
<u>Cretan</u> , <u>Cyrenaean</u>	κωρᾱ		ξηνος

Lesbian ξέννος as well as ἔννεκα 'on account of', found in the late inscriptions and grammatical accounts of the Graeco-Roman period, may be considered Aeolic hypercorrections. They are based on a misunderstanding of the sources of Aeolic *-nn-*: **sn*, **ns* or **nj* but not **nw*. The reconstruction of **nw* in **ksenwos* is affirmed by Mycenaean ke-se-nu-wo /ksenwos/. On the other hand, it is likely that there was no **nw* in ἔννεκα since Mycenaean spells this word e-ne-ka.

	<u>Lesbian</u>	<u>Attic</u>	<u>Ionic</u>	<u>Cretan</u> <u>Cyrenaeen</u>
	korwā	korwā	korwā	korwā
<i>Fronting</i>	-	korwē	korwē	-
<i>w → ∅ / Sonorant</i>	korā	korē	korē	korā
<i>+ 3rd Lengthening</i>	-	-	kōrē	kōrā
<i>Raising</i>	-	korē̄	kōrē̄	-
	ksenwos	ksenwos	ksenwos	ksenwos
<i>w → ∅ / Sonorant</i>	ksenos	ksenos	ksenos	ksenos
<i>+ 3rd Lengthening</i>	-	-	ksēnos	ksēnos
<i>Raising</i>	-	-	ksēnos̄	-

Alternatively Ionic forms like /kōrē̄/ can be explained by metathesis of velar glide (with parallel to the palatal glide metathesis in Lesbian and Cyrenaeen):

	<u>Ionic</u>	<u>Lesbian</u> <u>Cyrenaeen</u>
	korwā	pansja
<i>Metathesis of glide</i>	kourā	painsa
	⋮	⋮
	kourē̄ (= /kōrē̄/)	paissa

This possibility cannot be ruled out a priori; notice, however, that the derivation would not be as direct in words with a front vowel in the root like **ksenwos* → *ksēnos*.

The relative chronology of the 2nd and 3rd compensatory lengthening has been worked out by Bartoněk (1966:64-70, 174-5). The 3rd lengthening is shown to follow the 2nd lengthening by three generations between 800 and 700 B.C.:

<u>Absolute-relative chronology</u>		p ^h eronti ⋮ ⋮	
B.C.	ephansa	p ^h eronsi	korwā
1000 <i>1st Lengthening</i>	ephāna	-	-
900 <i>Fronting</i>	eph ^h āna	-	korwā
800 <i>Raising - 2nd Lengthening</i>	eph ^h ēna	p ^h erōsi	-
<i>Raising</i>	-	p ^h erōsi	korwē
700 <i>3rd Lengthening</i>	-	-	kōrē
<i>Raising</i>	-	-	kōrē

Again it might be argued that there was in fact no third lengthening but that the lengthening of *p^heronsi* and *korwā* took place at the same time. In fact all that is certain is that both followed the fronting $\bar{\alpha} \longrightarrow \bar{\alpha}$:

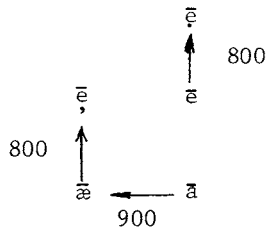
	ephansa	p ^h eronsi	korwā
1000 <i>1st Lengthening</i>	ephāna	-	-
900 <i>Fronting</i>	eph ^h āna	-	korwā
800 <i>Raising - 2nd Lengthening</i>	eph ^h ēna	p ^h erōsi	kōrē
<i>Raising</i>	-	p ^h erōsi	kōrē

Finally, the picture for Ionic (excluding Attic) would be unchanged if the 3rd lengthening accompanied the 1st lengthening (prior to the fronting of $\bar{\alpha} \longrightarrow \bar{\alpha}$):

	ephansa	korwā
1000 <i>1st Lengthening</i>	ephāna	kōrā
900 <i>Fronting</i>	eph ^h āna	kōrā
800 <i>Raising</i>	eph ^h ēna	kōrē

For these reasons it seems that there is not sufficient justification for a separate lengthening process in the environment before a *sonorant + velar glide*. It is probable that the putative 3rd lengthening was in fact the 2nd lengthening in some of the Doric dialects and the 1st lengthening elsewhere (e.g. in Ionic).

The whole theory of relative chronology is related to the European structuralist concept of the causality of sound change. The raising of $\bar{\alpha} \longrightarrow \bar{\alpha}$ following (or coinciding with) the raising of $\bar{\alpha} \longrightarrow \bar{\alpha}$ is an instance of a push-chain, see Martinet (1955:59).



	selasnā	esmi
<i>Fricative Weakening</i>	selahnā	ehmi
1000 <i>1st Lengthening</i>	selānā	ēmī
900 <i>Fronting</i>	selānā	-
800 <i>Raising</i>	selēnē	ēmī

2.5.3 Raising of Long Mid Vowels in Dialects

Proto-Greek short mid vowels *e and *o became long mid vowels /ē/ and /ō/ by compensatory lengthening. These two merged with long Proto-Greek /ē/ and /ō/ in the 'peripheral' dialects (Arcado-Cypriot, Aeolic and Doric dialects). In the other Greek dialects (Attic-Ionic, North-West, Corinthian, Megarian and East Argolic) the resulting long mid vowels were raised and became half-close vowels /ē̄/ and /ō̄/. As half-close vowels they remained distinct from the Proto-Greek vowels which were half-open. See Bartoněk (1966:172) for the traditional presentation (without diphthongs /ui, eu, au/).

Figure 2-12. Vocalic phonemes of Arcado-Cypriot, Aeolic and Doric dialects (after the 1st compensatory lengthening).

ī, i	u, ū	ui	eu
ē, e	o, ō	ei, oi	ou
ā, a		ai	au

Figure 2-13. Vocalic phonemes of Attic-Ionic, North-West and Saronic dialects (after the 1st compensatory lengthening and raising of mid vowels).

ī, i	u, ū	ui	eu
ē̄	ō̄		
e	o	ei, oi	ou
ē̄	ō̄		
ā, a		ai	au

This kind of structural analysis is obviously problematic since Attic-Ionic, North-West and the Saronic group of dialects are overdifferentiated. It is well known that languages do not contrast half-close /ē,ō/, half-open vowels /ē,ō/ and diphthongs /ei,ou/. As shown in 2.3, the diphthongs /ei,ou/ are best considered phonemic variants of half-close vowels /ē,ō/. This means of course that even Proto-Greek and 'peripheral' dialects (Arcado-Cypriot, Aeolic and 'strict' Doric) can be phonemicized as a 4-grade system (or a 3-grade system with the diphthongs /ei, ou/).

Thus notations (1) and (2) are equivalent in terms of structural oppositions:

(1)	ī,i	u,ū	ui	eu
	ē,e	o,ō	ei,oi	ou
	ā,a		ai	au
(2)	ī,i	u,ū	ui	eu
	ē	ō		
	e	o	oi	
	ē	ō		
	ā,a		ai	au

Similarly there are two ways to phonemize Mycenaean data:

	(1)	(2)
re-qo-me-no (= λευόμενος)	/leik ^w omenos/	/lēk ^w omenos/
me-no (= μηνός)	/mēnos/	/mēnos/
qo-u-ko-ro (= βουκόλος)	/g ^w oukolos/	/g ^w ōkolos/
a-to-ro-qo (= άνθρωπος)	/anth ^h rōk ^w os/	/anth ^h rōk ^w os/

Let us examine some phonemic notations from Classical dialects:

Proto-Greek	'strict' Doric	Attic-Ionic
*keimai 'lie'	κειμαι /keimai/	κεῖμαι /keimai/
*patēr 'father'	πατηρ /patēr/	πατήρ /patēr/
*esmi 'I am'	ημι /ēmi/	εἰμι /ēmi/

After compensatory lengthening *esmi* → *ēmi*, /ē/ in /ēmi/ merged with /ē/ in /patēr/ in 'strict' Doric, but not in Attic-Ionic, where it was raised /ēmi/ → /ēmi/. If for argument's sake we assume that it merged with the Proto-Greek

diphthong /ei/ we have to assume that [keimai] is only a phonetic - not phonemic - transcription for Attic-Ionic. Consequently we would have to adopt phonemic notation (1) or (2) above:

<u>Attic-Ionic</u>	<u>Phonetics</u>	<u>Phonemics (1)</u>	<u>Phonemics (2)</u>
	[keimai]	/keimai/	/kēmai/
	[pat̪er] or [patēr]	/patēr/	/pat̪er/
	[ēmi] or [ē̃mi]	/eimi/	/ē̃mi/

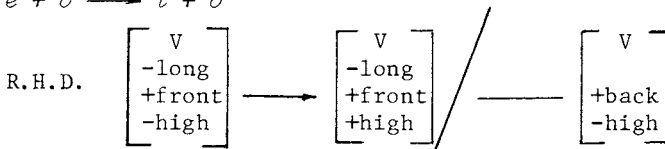
Thus a solution seems to be to assume underlying diphthongs /ei/ and /ou/ for 'peripheral' dialects (Aeolic, Arcado-Cypriot, 'strict' Doric) and underlying monophthongs /ē/ and /ō/ for Attic-Ionic, North-West and Saronic dialects. In historical terms this means that in the second group of dialects Proto-Greek diphthongs /ei/ and /ou/ became phonemic variants of half-close mid vowels /ē/ and /ō/ subsequent to compensatory lengthening and raising of Proto-Greek *e and *o in certain environments or through isovocalic contractions.⁶

2.6 VOWEL SEQUENCES IN DIALECTS

2.6.1 Height Dissimilation

In the Aeolic and Doric dialects (and also in Cypriot) a front mid vowel occurs subject to *regressive height dissimilation* in the environment before a back mid vowel:

Regressive Height Dissimilation A short front mid vowel becomes high in the environment before a back mid vowel:
 $e + o \longrightarrow i + o$



This rule is needed to account for the following data:

<u>Lesbian</u>	χρῦσος	<u>Homeric</u>	χρῦσεος	'golden'
<u>Thessalian</u>	λίθλος	"	λίθεος	'made of stone'
<u>Boeotian</u>	ἰών	<u>Attic</u>	ἐγώ	'I'
<u>Cypriot</u>	λοντα (Acc) but	<u>Arcadian</u>	εοντος (Gen)	'being'
<u>Central Cretan</u>	πολλομενολ	<u>Attic</u>	πολούμενολ	'made' (Pl)

<u>Laconian</u> ,	θεός	<u>Attic</u>	θεός	'god'
<u>Argolic</u>				

In some dialects the environment of regressive height dissimilation included even a low vowel: $e \begin{Bmatrix} o \\ a \end{Bmatrix} \longrightarrow i \begin{Bmatrix} o \\ a \end{Bmatrix}$.

The appropriate class can be defined in negative terms:

$\begin{bmatrix} \text{-front} \\ \text{-high} \end{bmatrix}$. We have evidence from Cypriot, Central Cretan and Boeotian (also Pamphylian, but I do not find any instances of the change $eo \longrightarrow io$ in this dialect).

<u>Cypriot</u>	ἔτη (but <u>Arcadian</u> ἔτεα 'years')	<u>Attic</u>	ἔτη 'words'
	κατεθελαν (but <u>Arcadian</u> συνεθεαν)	<u>Attic</u>	ἔθεσαν
			'they put down'

Boeotian ἀνεθελαν 'they set up'

Central Cretan δῶρεαν 'gift' (Acc) Attic ἔτη (< ἔτεα) 'years'

Pamphylian ἔτεα 'years'

The situation in Cretan dialects is quite complicated. Regressive height dissimilation before non-high back vowels o, a is documented in Central Cretan and in the eastern transitional region (Dreros and Latos) but this process did not take place in dialects spoken in western and eastern parts of the island. In both East and West Cretan dialects the e of contract verbs was syncopated before o in closed syllables e.g. κοσμοντες versus Central Cretan κοσμιοντες (κοσμιω 'be a member of the body of chief magistrates'), however, in open syllables $e + o$ contract into $\bar{o}$, e.g. εὐχαριστωμες 'be thankful' (Allaria). The distribution is further complicated in some cities (Lappa, Phaselis) by the presence of $e + o$ contracted into $\bar{o}$ even in closed syllables. And finally, $e + o$ in both open and closed syllables may remain unchanged (Itanos, East Cretan):⁷

	<u>Closed syllable</u>	<u>Open syllable</u>
<u>East Cretan</u> (Itanos)	-eo-	-eo-
<u>Central Cretan</u>	-io-	-io-
<u>West Cretan</u>	-o-	- $\bar{o}$ -
<u>West Cretan</u> (Lappa, Phaselis)	- $\bar{o}$ -	- $\bar{o}$ -

Central Cretan

<i>Regressive Height</i>	kosmeontes	kosmeomes
<i>Dissimilation</i>	kosmiontes	kosmiomes
<u>West Cretan</u>	kosmeontes	kosmeomes

<i>Assimilation</i>	kosmoontes		kosmoomes
<i>Syncopation</i>	kosmontes	<i>Contraction</i>	kosmōmes
	(Lappa, Phaselis)		
	kosmeontes		
<i>Assimilation</i>	kosmoontes		
<i>Contraction</i>	kosmōntes		

According to Buck, (1955:22) regressive height dissimilation preceded the loss of intervocalic *w*, since *e* which appeared before another vowel with the loss of *w* was unaffected. This hypothesis is based on certain forms from Cretan, Laconian and Heracleian, where *eo* becomes regularly *io*, except where the *eo* goes back to **ewo*:

Cretan καλῶν 'calling' but υἱεὸς 'son' (**huiewos* Gen)
 Heracleian ἀδικῶν 'doing wrong' but ρεόντα 'flowing'
 (**hrewonta* Acc)

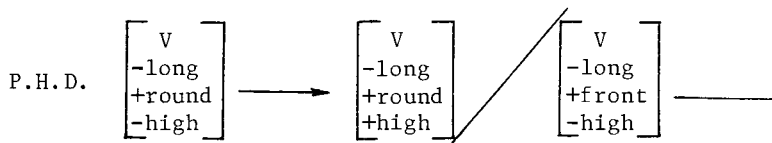
	adikeōn	rewonta
R.H.D.	adikiōn	-
$w \longrightarrow \emptyset / V - V$	-	reonta

Another point regarding the relative chronology of R.H.D. can be made in connection with Boeotian ἰών 'I' (= ἐγώ). Here *e* and *o* could have become adjacent only after the frication of the velar stop *g* (which could take place as early as the 4th B.C.), and palatal development $\gamma \longrightarrow j$ after a front vowel. *j* could be felt only as an automatic glide. Thus the *regressive height dissimilation* should be later than these processes:

	egō
<i>Frication</i>	eγō
<i>Palatalization</i>	ejō
R.H.D.	ijō

In Ionic (and some Doric dialects) a back mid vowel is subject to a process of *progressive height dissimilation* in the environment after a front mid vowel:

Progressive Height Dissimilation A back mid vowel becomes high in the environment after a short front mid vowel:
 $e + o \longrightarrow e + u$



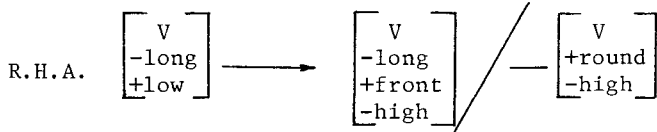
Buck (1955:40) cites evidence for progressive height dissimilation from:

- The texts of various early authors, e.g. Homeric μέν 'of me' (Attic μου), φιλεῦντας 'loving' (uncontracted φιλέοντας) Acc Pl.
- The spelling -EY- as a generalized phenomenon in Ionic inscriptions in the 4th c. B.C.
- The same spelling also occurring in many other areas like Rhodes and Cos, Thera and Cyrene, Megara, etc. This indicates that progressive height dissimilation was a fairly common synchronic process existing in many dialects - Ionic, East Aegean Doric, Cyrenaean, Megarian. See e.g. Coan κυεσσα [kueosa], κευυσα 'pregnant' (Attic κυοῦσα [kuōsa]).

2.6.2 Height Assimilation

In various dialects a low vowel occurs subject to *progressive height assimilation* in the environment before a back mid vowel.

Regressive Height Assimilation A low vowel becomes front mid in the environment before a back mid vowel: $a + o \longrightarrow e + o$



There is both literary and inscriptional evidence from West Greek dialects for this process. Regressive height assimilation is followed by contraction in Rhodian and by regressive height dissimilation in Boeotian and Central Cretan but its product *eo* remains unchanged in Aetolian and Phocian.

<u>Attic</u>	τῆμῶντες	<u>Attic</u>	τῆμῶσα
<u>Rhodian</u>	τῆμουντες	<u>Rhodian</u>	τῆμουσα
<u>Aetolian</u>	τῆμεοντες	<u>Phocian</u>	τῆμεουσα
<u>Central Cretan</u>	τῆμιοντες	<u>Central Cretan</u>	τῆμιονσα
		<u>Boeotian</u>	τῆμιωσα

The difference between Attic τῆμῶσα /tīmōsa/ and Rhodian τῆμουσα /tīmōsa/ is the consequence of regressive height assimilation, which did not take place in Attic. Since in

Attic one of the contracting vowels is low the resulting vowel must be low. In Rhodian after the regressive height assimilation both contracting vowels are non-low and the resulting vowel is non-low as well.

CONTRACTING DIALECTS

		Complete Assimilation	Contraction	<u>Attic</u>
	a+o	→	ō+o →	ō̄
	↓ R.H.A.			
<u>Aetolian,</u> <u>Phocian</u>	e+o	→	o+o →	ō̄ <u>Rhodian</u>
	↓ R.H.A.			
<u>Boeotian,</u> <u>Central</u> <u>Cretan</u>	i+o			

Contracting dialects

	<u>Attic</u>		<u>Rhodian</u>	
	tīmaontes	tīmaōsa	tīmaontes	tīmaōsa
<i>R.H.A.</i>	-	-	tīmeontes	tīmeōsa
<i>Assimilation</i>	tīm̄ontes	tīm̄ōsa	tīmoontes	tīmoōsa
<i>Contraction</i>	tīm̄ontes	tīm̄ōsa	tīm̄ontes	tīm̄ōsa

non-contracting dialects

	<u>Aetolian</u>	<u>Boeotian</u>	<u>Cretan</u>	
	tīmaontes	tīmaōsa	tīmaontes	tīmaonsa
<i>R.H.A.</i>	tīmeontes	tīmeōsa	tīmeontes	tīmeonsa
<i>R.H.D.</i>	-	tīmiōsa	tīmiontes	tīmionsa

2.7 CONTRACTIONS IN ATTIC AND OTHER DIALECTS

	<u>Attic - Ionic</u>	<u>Doric</u>
a)	ᾗ + ὠ → ῶ̄	a + ὠ → ὠ̄
		ᾗ + ὠ → ᾗ̄
b)	a + ἔ → ᾗ̄	a + ἔ → ē̄ also <u>Aeolic</u> and <u>Arcado-Cypriot</u>
	ᾗ + ἔ → ῥ̄̄	ᾗ + ἔ → ᾗ̄ also <u>Aeolic</u>

c) $e + \bar{a} \longrightarrow \bar{e}$ γένη 'kinds'
but $\bar{a}$ in ὅστᾱ

d) $o + \bar{a} \longrightarrow \bar{o}$ αἰδῶ
'shame' (Acc)
but $\bar{a}$ in ἀπλᾱ

$o + a \longrightarrow \bar{o}$

$o + \bar{a} \longrightarrow \bar{a}$ sometimes in Doric
and Aeolic

$\bar{o} + a \longrightarrow \bar{o}$

e)

$e + e \longrightarrow \bar{e}$

$e + \bar{u} \longrightarrow \bar{o}$ Cretan

$o + o \longrightarrow \bar{o}$

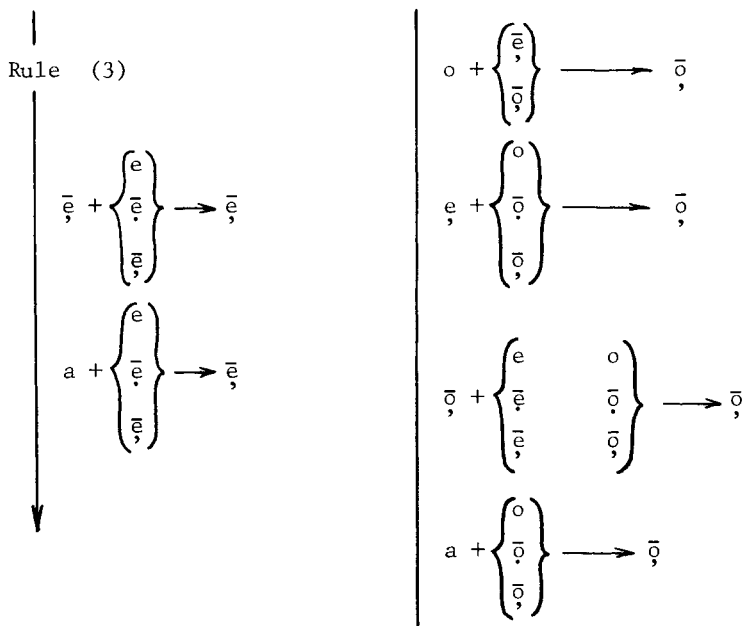
Note: Anomalous contractions like ὅστᾱ (< ostea) 'bones' and ἀπλᾱ (< haploa) 'simple' (Neuter Pl) are best explained as due to analogy with neuters in -a.

For the traditional presentation of Attic rules of contractions see Lejeune (1972:260-3); the following generalizations can be made:

- (1) A vowel resulting from the contraction is always long.
- (2) If one of the contracting vowels is round the resulting vowel will be round.
- (3) If one of the contracting vowels is low the resulting vowel will be low.

Figure 2-14. Attic rules of vocalic contraction

$e + \left\{ \begin{matrix} e \\ \bar{e} \end{matrix} \right\} \longrightarrow \bar{e}$	Rule (2)	
	$o + \left\{ \begin{matrix} e & o \\ \bar{e} & \bar{o} \end{matrix} \right\} \longrightarrow \bar{o}$	
	$e + \left\{ \begin{matrix} o \\ \bar{o} \end{matrix} \right\} \longrightarrow \bar{o}$	
$e + \bar{e} \longrightarrow \bar{e}$ $e + a \longrightarrow \bar{e}$ (or $\bar{a}$)	$e + \bar{o} \longrightarrow \bar{o}$	
	$o + a \longrightarrow \bar{o}$ (but also $\bar{a}$!)	



Rules (2) and (3) are not valid for other dialects (Doric, Aeolic and Arcado-Cypriot).

In the case of Doric, (2) suffices as an approximation but an additional regularity must be built in:

If one of the contracting vowels is $\bar{a}$, the resulting vowel will be $\bar{a}$.

Furthermore (3) must be replaced by the rule:

The contraction of $a + \bar{e}$ results in $\bar{e}$.

The most basic difference between the Attic and Doric type of contraction emerges from the case where one of the contracting vowels is $\bar{a}$. Whilst Doric vowels could be hierarchized $\bar{a} \bar{o} \bar{e}$ (the surviving vowel of a sequence of two will be that which occurs first in this series), the Attic scale would be $\bar{o} \bar{e} \bar{a}$. The feature 'round' is dominant in Attic, but in Doric it is the feature 'low'. This is clear from the examples below:

	<u>Attic</u>	<u>Doric</u>	
hāēlios	ἥλιος	ḗλιος	'sun'
peināōmen	πεινώμεν	πεινώμες	'we are hungry'
kh̥rūseā	χρυσῆ		'golden'

The results of contraction in Attic and Doric are the same only for $\bar{a} + \bar{o}$, since the progressive assimilation operates

in Attic-Ionic while regressive assimilation is observed in Doric.

	<u>Attic-Ionic</u>	<u>Doric</u>	
tīmā+omen	τιμῶμεν	τιμῶμες	'we honor'
tīmā+ete	τιμᾶτε	τιμήτε	
peinā+omen	πelinῶμεν	πelinᾶμες	'we are hungry'
peinā+ete	πelinῆτε	πelinᾶτε	

<u>Attic-Ionic</u>	/a/ + /o/		
	/ā/ + /o/	→ /ō/	regressive assimilation
	/a/ + /e/	→ /ā/	progressive "
	/ā/ + /e/	→ /ē/	regressive "
<u>Doric</u>	/a/ + /o/	→ /ō/	regressive "
	/ā/ + /o/	→ /ā/	progressive "
	/a/ + /e/	→ /ē/	regressive "
	/ā/ + /e/	→ /ē/	

	<u>Attic-Ionic</u>		<u>Doric</u>
	tīmāomen		tīmāomes
<i>Regressive Assimilation</i>	tīmōomen	<i>Regressive Assimilation</i>	tīmōomes
<i>Contraction</i>	tīmōmen		tīmōmes
	tīmāete		tīmāete
<i>Progressive Assimilation</i>	tīmāete	<i>Regressive Assimilation</i>	tīmēete
<i>Contraction</i>	tīmāte		tīmēte
	peināomen		peināomes
<i>Regressive Assimilation</i>	peinōomen	<i>Progressive Assimilation</i>	peināames
<i>Contraction</i>	peinōmen		peināmes
	peināete		peināete
<i>Regressive Assimilation</i>	peinēete	<i>Progressive Assimilation</i>	peināate
<i>Contraction</i>	peinēte		peināte

The presence or absence of progressive and regressive assimilation preceding the contraction as well as the regressive height dissimilation simplified West Greek paradigms of contract verbs. Compare the 1st and 2nd Pl Ind of contract verbs in Attic and Doric:

<u>Attic-Doric</u>				
	1st Pl		2nd Pl	
<i>a + o</i>	τῦμῶμεν	<i>a + e</i>	τῦμᾶτε	ō̄ : ā
<i>e + o</i>	φιλοῦμεν	<i>e + e</i>	φιλεῦτε	ō̄ : ē
<i>o + o</i>	μισθοῦμεν	<i>o + e</i>	μισθοῦτε	ō̄ : ō̄
<i>ā + o</i>	πεινῶμεν	<i>ā + e</i>	πεινῆτε	ō̄ : ē̄
<u>Doric</u>				
<i>a + o</i>	τῦμῶμες	<i>a + e</i>	τῦμῆτε	ō̄ : ē̄
<i>e + o</i>	(φιλόομες)	<i>e + e</i>	(φιλέετε)	io : ie
<i>o + o</i>	μισθῶμες	<i>o + e</i>	μισθῶτε	ō̄ : ō̄
<i>ā + o</i>	πεινᾶμες	<i>ā + e</i>	πεινᾶτε	ā̄ : ā̄

A typical feature of the North West dialects and Boeotian is the Middle Participle in -εῦμενος (or -ημενος) from verbs in -ε. Traditionally they are explained as due to analogy with forms where εἰ (or η) goes back to *e + e* as the infinitive:

	<u>Attic</u>	<u>North West, Boeotian</u>	
Infinitive	φιλεῖσθαι	φιλεισθαι	↓ analogy
Participle	φιλοῦμενος	φιλειμενος	

In terms of processual analysis it can be said that Attic /ō̄/ results from *e + o* by regressive assimilation, while North West and Boeotian /ē̄/ is the result of progressive assimilation:

	<u>Attic</u>		<u>North West, Boeotian</u>
	phileomenos		p ^h ileomenos
<i>Regressive Assimilation</i>	philoomenos	<i>Progressive Assimilation</i>	phileemenos
<i>Contraction</i>	philō̄menos		philē̄menos

Another example of analogical extension is a set of forms in -ῆω and -ῶω, where the long-vowel stem of other tenses (Future, Aorist) was extended to the Present. As a result of this the paradigmatic contrasts in contract verbs are distributed differently in Attic and West Greek. This is

observable in the following data from Cretan and Phocian:

	-eo-	-oo-	-ao-	
<u>Attic</u>	φιλιοῦντες	μισθοῦντες	τῆμῶντες	$\bar{o} : \bar{o} : \bar{o}$
<u>Cretan</u>	φιλλιοντες	μισθωντες	τῆμιοντες	$io : \bar{o} : io$
<u>Phocian</u> ⁸	φιλληοντες	μισθωοντες	τῆμηοντες	$\bar{e}o : \bar{o}o : \bar{e}o$

NOTES

- 1 Lupaş (1972:123-6) regards the diphthongs of Attic as sequences of two phonemes (not as monophonematic units). She identifies the first segments of these diphthongs with simple vowels which occur in other environments (= allophones of vocalic phonemes) and she considers the palatal [i̯] and velar glide [ɥ] as realizations of archi-phonemes /I/ and /U/. In this position [i̯] contrasts regularly with [i]; but [u] contrasts only with [ü], e.g. ἄιστος [áistos] 'unseen' versus αἰσχρός [aiskhrós] 'disgraceful'; αὐτίω [aütō] 'shout' versus αὐτός [autós] 'self'. As is obvious, this solution necessitates the introduction of the zero phoneme (= juncture) before all high vowels in hiatus: /ā-istos/, /a-ütō/.

This problem is a trivial one in the framework of generative phonology, where forms like Διῦ [dií] would be derived from underlying /dyewi/, see Sommerstein (1973:114). However, difficulties would arise if dialectal forms like Cypriot πτόλῑ (vs. πόλῑ < πόλῑῑ in many dialects) were taken into account. In historical retrospective the intervocalic *w* was lost (this is duly repeated by the derivations of generative phonology):

5th c. 4th c.

Systematic level /awidos/ /dyewi/ /druwinos/ /druwinos/

Autonomous level /ā-istos/ /di-í/ /drú-inos/ /drú-inos/

Phonetics: [áistos] [dií] [drúinos] [drúinos]

- 2 These generalizations are made on the basis of data in Lupaş (1972:101-2).
- 3 Allen (1974:77) points out that the concomitant factor of quality might exist in the case of /ōi/ versus /oi/, since it seems that one of the phonetic values of the phoneme /oi/ was [ōi]. Consequently, the opposition of /ōi/ versus /oi/ could be realized phonetically as [oi] versus [ōi]:

/lógōi/ Dat Sg versus /lógoi/ Nom Pl
[lógoi] [lóg^oi]

This view may be supported by phonetic interpretation of spellings OE or OEI instead of etymological OI, found in various inscriptions older than 350 B.C., e.g. in Attic (Κρεσος Kretschmer, *Griech. Vasenschr.* 129), Corinth αὐτοτο(ε)λα = αὐτοτολα, Schwyzler (1923:123,4).

- 4 Allen (1974:79) interprets the diphthong /ei/ in the environment before a vowel phonetically as [eyy] and thinks first of the reduction [eyy] → [ey] as a reason for the delayed monophthongization, when compared with /ei/ before a consonant, which can be interpreted only as [ey]. Some spellings in Homer apparently support this interpretation e.g. τελέω [teleyō] beside τελεῖω [teleyyō] etc. When later on [ey] was monophthongized into [ē] the second [y] became an automatic glide. Since there is a well-established parallelism between ευ and ου Allen wonders whether a similarly delayed development applied to prevocalic ου /ou/. He hypothesizes that at some earlier period its value could have been [oww] and finds a support for this in Attic ἀκοή [akowē] beside Homeric ἀκουή [akowwē]. Later on the intervocalic [w] was lost in Attic [akowē] → [akoē], whereas in Homeric [ow] was monophthongized: [akowwē] → [akōwē]. Similarly can be interpreted Attic ὥτός (<όατος < ὀφατος) beside Homeric οὔατος.
- 5 Lejeune (1972:153,238) explains Attic χύλινος, μῦλινος and ὑμῖνον by regressive assimilation. Similar examples are according to him βυβλίον (<βυβλῖον), ἱστία (<ἑστία) etc. Notice that /i/ in εὑμῖνον is supposed to have assimilated initial /ē/ at a distance.
- 6 Bartoněk (1966:63) claims that 'in this way the second group of dialects became different from the presupposed proto-Greek condition, because the origination of new long ē- and ō- phonemes resulted in the transformation of the hitherto existing three-grade system into a four-grade system'.

However, it is obvious that we do not have to do with any 'revolutionary transformation' of the three-grade system. All that happened was that some Proto-Greek contrasts were redistributed and some new contrasts appeared. Using my examples:

Proto-Greek

or /keimai/ : /patēr/ (esmi)
 /kēmai/ : /patēr/

Attic-Ionic

or /kēmai/, /ēmi/ : /patēr/
/keimai/, /eimi/ : /patēr/

'strict' Doric

/keimai/ : /pat̪er/, /ēmi/

or /k̑imai/ : /pat̪̑er/, /̑̑mi/

Schematically:

Proto-Greek after the 1st lengthening
 (represented as the
 4-grade system)

ī	ū	ī	ū
ei (=ē)	(ō=)ou	ē	ō
ē (=ē)	(ō=) o	ē	ō
ā		ā	

where $\frac{ei}{ē} = \frac{\bar{ē}}{\bar{ē}}$ where /ē/ = [ē] ~ [ei]

- 7 See Thumb-Kieckers (1932:149) for data on West Cretan:
 πειρασώμεθα (Cydonia), ὠνωμένος (Hierapytna)
 εὐορκῶσι (Hierapytna) - notice that this form indicates
 underlying **euorkeōsi* not **euorkeōnsi*; ἐπαινῶμεν (Aptera,
 Cydonia).

παρακαλῶντι (Lappa), διατηρῶντες (provenance unknown)
 ἐξαυρῶντες (Phaselis).

East Cretan: συνεσσεόμαι προδωσέω (Itanos)

There is also some evidence for regressive height
 dissimilation in both West and East Cretan (see M.
 Guarducci, *Inscriptiones Creticae* II and III, Roma 1939
 and 1942):

Eleutherna (West) κῆπαινύομεν (= καί ἐπαινέομεν)
 παρ' ἀμύων (= παρ' ἡμέων)

Itanos (East) ὄρκον τελ λόντω

if the reading is τελιόντω not τελειόντω

- 8 See Thumb-Kieckers (1932) for the actually documented
 Phocian forms:

e+o: ποιήουσα

o+o: μαστιγῶων, ἀπαλλοτριῶουσα (also Boeotian δᾱμιῶντες)

a+o: συλῆοντες and συλέοντες, ἐπιτῦμέοντες (also
 Aetolian τῦμέοντες).

Consonants

3.1 THE CONSONANTS OF ATTIC AND OTHER DIALECTS

3.1.1 *The Consonants of Classical Attic*

The phonological system of Classical Attic *obstruents* can be established on the basis of the following commutation tests:

- (a) voiceless - voiced
- (b) non-aspirated - aspirated or sibilant
- (c) aspirated or sibilant - voiced
- (d) short - long (geminated)
- (e) aspirated or sibilant - glottal fricative
- (f) labial - dental
- (g) labial - velar
- (h) dental - velar

Examples are mainly taken from Lupaş (1972:110-14):

- | | | | | | | |
|-----|-------------------------|---------|---------------|---|---------|-----------------|
| (a) | /p/ - /b/ | πᾶθος | 'experience' | - | βάθος | 'depth' |
| | /t/ - /d/ | τόμος | 'slice, cut' | - | δόμος | 'house' |
| | /k/ - /g/ | κέρας | 'horn' | - | γέρας | 'prize, reward' |
| (b) | /p/ - /p ^h / | πόρος | 'passage' | - | φόρος | 'tribute' |
| | /t/ - /t ^h / | τείνω | 'stretch' | - | θείνω | 'strike' |
| | /k/ - /k ^h / | Κρόνος | 'Cronos' | - | χρόνος | 'time' |
| | /t/ - /s/ | τορός | 'piercing' | - | σορός | 'urn' |
| (c) | /p ^h / - /b/ | φαίνω | 'make appear' | - | βαίνω | 'go' |
| | /t ^h / - /d/ | θάπτω | 'bury' | - | δάπτω | 'devour' |
| | /k ^h / - /g/ | χεῦμα | 'stream' | - | γεῦμα | 'taste' |
| | /s/ - /d/ | σῶμα | 'body' | - | δῶμα | 'house' |
| (d) | /p/ - /pp/ | | ? | | | |
| | /t/ - /tt/ | πλάττει | 'breadth' | - | πλάττει | 'form, shape' |
| | | | (Dat) | | | |
| | /k/ - /kk/ | κάκη | 'wickedness' | - | κάκηκη | 'human ordure' |

		<u>Ionic</u>	
	/s/ - /ss/	πρᾶσει 'sale' (Dat) -	πρᾶσσει 'make' (West Ionic)
		ῆσαι 'be seated' (2nd Sg) -	ῆσσαι 'defeats'
(e)	/p ^h / - /h/	φύσω 'beget' (Fut) -	ϋσω 'send rain' (Fut)
	/t ^h / - /h/	θύω 'sacrifice' -	ϋω 'send rain'
	/k ^h / - /h/	χώρα 'country' -	ῶρα 'season'
	/s/ - /h/	σός 'yours' -	ός 'who'
(f)	/p/ - /t/	ποῦτος 'of what sort' -	τοῦτος 'such'
	/b/ - /d/	βόλος 'net' -	δόλος 'wile, treachery'
	/p ^h / - /t ^h /	φῶ 'say' (Subj Pres) -	θῶ 'put' (Subj Aorist)
(g)	/p/ - /k/	πληρῶ 'make full' -	κληρῶ 'draw lots'
	/b/ - /g/	βοῶ 'shout' -	γοῶ 'wail'
	/p ^h / - /k ^h /	φόρτος 'load' -	χόρτος 'feeding-ground'
(h)	/t/ - /k/	τέρας 'wonder, marvel' -	κέρας 'horn'
	/d/ - /g/	δέρων 'flay' (Part) -	γέρων 'old man'
	/t ^h / - /k ^h /	θέω 'run' -	χέω 'pour'

Similarly the following minimal pairs can establish phonological system of *nasals* and *liquids*:

(a)	labial nasal	-	labial obstruent
(b)	dental nasal	-	dental obstruent
(c)	labial nasal	-	liquid
(d)	dental nasal	-	liquid
(e)	short	-	long (geminated)
(f)	labial nasal	-	dental nasal
(g)	trill	-	lateral liquid
(h)	liquid	-	sibilant

(a)	/m/ - /p/	μόνος	'sole'	-	πόνος	'toil'
	/m/ - /b/	μαῖνω	'drive mad'	-	βαῖνω	'go'
	/m/ - /p ^h /	μαῖνω		-	φαῖνω	'make appear'
(b)	/n/ - /t/	νόμος	'law'	-	τόμος	'cut, slice'
	/n/ - /d/	νόμος		-	δόμος	'house'
	/n/ - /t ^h /	νέα	'new' (Fem)	-	θέα	'seeing, view'
	/n/ - /s/	νοῦ	'mind' (Gen)	-	σοῦ	'yours' (Gen)
(c)	/m/ - /r/	μαῖνω		-	ῥαῖνω	'sprinkle'
	/m/ - /l/	μανθάνω	'learn'	-	λανθάνω	'escape notice'
(d)	/n/ - /r/	νέω	'swim'	-	ρέω	'flow'

	/n/ - /l/	νεώς	'temple'	-	λεώς	'people'
(e)	/m/ - /mm/	λήμα	'will, desire'	-	λήμμα	'anything received'
	/n/ - /nn/	γενικός	'generic'	-	γεννικός	'noble'
	/r/ - /rr/	πυρός	'fire' (Gen)	-	πυρρός	'flame-coloured'
	/l/ - /ll/	ἄλη	'wandering'	-	ἄλλη	'another' (Fem)
		μέλει	'song' (Dat)	-	μέλλει	'intends to do'
(f)	/m/ - /n/	μάττω	'knead dough'	-	νάττω	'pack close'
(g)	/r/ - /l/	ῥύμη	'swing'	-	λύμη	'maltreatment'
(h)	/r/ - /s/	ῥαίνω	'sprinkle'	-	σαίνω	'wag the tail'
	/l/ - /s/	λήμα		-	σημα	'sign'

3.1.1.1 Phonemic variants

(a) Clear and dark *l*

In Attic the lateral liquid was probably a clear variant in all environments (or more precisely, we do not possess any inscriptional evidence that /l/ was velarised before consonants). However, in some dialects - most notably in Central Cretan - there is evidence for the dark [ɫ] as is shown by these spellings:

καυχος and καλχος 'copper' (= χαλκός)
 Φευμενος 'assembled' (= Φελμενος)
 αδευπιος 'brother' (= Ionic ἀδελφεός)

On the basis of such spellings we may justify the phonetic reconstructions [kalk^hos] or even [kavk^hos] with over-dark [ɫ].

(b) The velar nasal [ŋ] occurs predictably in the environment before the velar stops *k*, *g*, *k^h*. The usual spelling is with Γ: e.g. ἐγγύς 'near', but in certain archaic inscriptions, spellings with Ν are quite common: e.g. ενγυς (also ανφοτερος = ἀμφοτέρος). Obviously, the first spelling indicates the place of articulation (velar) and the second indicates the manner of articulation (nasal). Greek did not develop a special grapheme for this phonemic variant as Sanskrit and the Old Germanic Runic systems did.

The interpretation of the spellings ΓΜ and ΓΝ remains controversial. I assume with Lejeune (1972:146) and Lupas (1972:20-2) against Sturtevant (1940:64-5) and Allen (1974:33-5) that the phonetic value of Γ before nasals was not a velar nasal [ŋ] but a velar stop [g]. The main reason for the reconstruction ΓΜ [ŋm] is a parallelism of certain forms like

τέτριμμα (τρῦβω 'rub') i.e. b + m → m + m
 λέλεγμα (λέγω 'talk') g + m → ŋ + m

In my view this parallelism is irrelevant since the alleged change *g* → *ŋ* does not exactly parallel the change *b* → *m*.

These two are homorganic sounds, but *g* and *m* are not. Similarly, there is no cogent reason for reconstructions like φθέγμα [p^hthema]. The spelling ΓΜ represents here a graphic simplification for *φθέγμα (cf. φθεγγομαι). Admittedly, the triadic cluster ηgm could be simplified in two ways - either [ηm] or [gm]. However, the analogy could restore [gm] easily in paradigms like ἔφθεγμα, ἔφθεγμα. My main reason for reconstruction with [gm] is the lack of positive evidence for [ηm] - there are no examples of the spelling NM (instead of ΓM).

(c) The feature of voice was not contrastive in sonorants and sibilants. Voiceless [r] occurred in these environments:

- i) initially ρύμη [r^humē]
- ii) after *r* πυρρός [purros]
- iii) after aspirates

φρήν	[ph ^h rēn]
θρόνος	[th ^h ronos]
χρόνος	[kh ^h ronos]

According to the ancient grammarians *r* was 'aspirated' initially and in geminates, and this is supported by isolated dialectal spellings (Corcyrean ροφαυσι), Latin transcriptions (*Pyrrhus*) and the Byzantine spellings ρ and ρ̣ (Allen, 1974:39). Sturtevant (1940:62) interpreted correctly the varying spellings PH ~ HP in the sense, that the aspiration was simultaneous with the articulation of *r*. Modern phonetics clarified the relationship between aspiration and voicelessness by relating the former to the state of the glottis during and immediately after the release of the stricture. Thus, according to Ladefoged (1971:9) 'in any aspirated sound the vocal cords are in the voiceless position during the release'. In other words, we may assume that *r* in the environment after *p^h*, *t^h*, *k^h* could have been partly unvoiced (or even voiceless, as in English *pray*). There are some Latin transcriptions of Greek words which evidently support this interpretation, e.g. χρυσίππος [kh^husippos] Latin *Crhysippus*.

Evidence for voiceless [l] is meagre, see Lejeune (1972:144). In this sense can be interpreted isolated examples like λαβόν [labōn] from Aegina (Argolic dialect).

Voiceless nasal and lateral liquid may be postulated in the environment after aspirates for the same reason as in the case of [r] after aspirates, e.g. σταθμός [stat^hmos] 'stable', αἰχμή [aik^hmē] 'edge', θνητός [th^hnetos] 'mortal', φλέγω [ph^hlegō] 'burn' etc.

(d) Voiced sibilant [z] does not possess a phonemic status in Classical Attic and can be regarded as a phonemic variant of the voiceless sibilant /s/. It occurs only medially before voiced obstruents, and sonorants. Furthermore, the clusters

of voiced sibilant plus dental nasal or liquid occur only in compound words.

	[zb]	πρεσβεύω	'be the elder'
	[zd]	τράπεζα	'table'
	[zg]	φάσγανον	'sword'
	[zm]	θεσμός	'law'
/s+n/ →	[zn]	προσνέμω	'assign'
/s+r/ →	[zr]	εἰσρέω	'stream into'
/s+l/ →	[zl]	προσλαμβάνω	'take besides'

We may safely assume that voicing was only optional in the last three cases and in the clusters of sibilant plus voiced stops or labial nasal in compound words:

/s+b/ →	[zb]	προσβολή	'attack'
/s+d/ →	[zd]	εἰσδέχομαι	'admit'
/s+g/ →	[zg]	δυσγενής	'low-born'
/s+m/ →	[zm]	δυσμενής	'hostile'

Notice that phonetic spellings like ψηφισμα (= φήφισμα) appear in the 4th c. B.C.

Classical Attic did not have a voiced affricate [dʒ] in its phonemic inventory. /dʒ/, as a phoneme, existed in earlier times in all dialects (it developed through palatalization and affrication of Proto-Greek *dj and *gj → d'z'j' → dz). However, before Classical times dz was metathesized in Attic and in most other dialects: dz → zd. That the letter Z represents the cluster /zd/ can be established by facts like these:

i) θύρας + δε 'to the door' (cf. οἶκόν+δε 'to home') is spelled θύραζε.

ii) The treatment of nasal before Z /zd/ corresponds to that before /st/. -n in συν is lost before st/d- but -n in ἐν is preserved:

συστέλλω	[sustellō]	'draw together'
συζεύγνυμι	[suzdeugnūmi]	'yoke together'
ἐνστέλλω	enstellō	'dress in'
ἐνζεύγνυμι	enzdeugnūmi	'yoke in'
	sun+stellō	en+stellō
Cluster Simplification sustellō		—
	sun+zdeugnūmi	en+zdeugnūmi
Cluster Simplification suzdeugnūmi		—

iii) The interpretation /zd/ not /dʒ/ is favoured by various structural considerations. Contrast the inventory of initial and medial clusters of the type *sibilant + voiceless* and *sibilant + voiced obstruent*. There would be no symmetry of the inventory of voiceless and voiced clusters if there were a voiced affricate /dʒ/ (or alternatively the pressure of

this subsystem could cause the preclassical metathesis $dz \longrightarrow zd$:

sp-	-sp-	zb-	-zb-
st-	-st-	zd-	-zd-
sk-	-sk-	∅	-zg-
σπεύρω	ἐσπέρα	σβέννυμι	πρεσβεύω
στόμα	ἐστί	ζέω	τράπεζα
σκότος	διδάσκω		φάσγανον

iv) Another systemic reason for the early metathesis $dz \longrightarrow zd$ can be seen in the distribution of dyadic clusters with a voiced obstruent as a first member:

bd	(bn)	br	bl	∅
gd	gm	gn	gl	∅
∅	dm	dn	dr	dz

The voiced affricate /d^z/ in a pre-classical system was isolated (there was no voiceless counterpart and there were no clusters *bz and *gz). By its metathesis a certain symmetry was achieved because now there was a complete set of dyadic clusters *bd*, *zd*, *gd*, combining a voiced labial, dental and velar obstruent + voiced dental stop.

It should also be mentioned that consonant clusters with initial *d-* are extremely rare (there are two or three examples of /d/ + nasal δμῶς 'slave', δνόφος 'darkness', δνοπαλύζω 'shake violently'), with the exception of *dr-*.

The voiceless aspirate /t^s/ existed as a phoneme in some dialects. Our evidence comes mainly from certain Arcadian and Central Cretan spellings. /t^s/ could be spelled in Arcadian with a special letter *U* as in *U*ς /t^sis/ 'who' (= τῖς), οἵεοι /ot^seoι/ 'to whomever' (cf. Homeric ὅτεω), or with a diagraph *TZ* (as in τζετρακαταῖα /t^setra-/ 'fourhundred') or *ZT* (as in ζτεραῖον, probably cognate with ζειρά 'upper garment'), or with *Z* as in οζυς /ot^sis/ 'whoever' (cf. Homeric ὅτις). On the interpretation of Cretan οζου see p.117, n.10.

3.1.1.2 Phonological system

The consonantal phonemes of Classical Attic may be tabulated by means of their features as in Figure 3-1. I have departed from the traditional three-term system (labial, dental, velar) in describing the Greek obstruents and will now be using (rather inconsistently) binary features *coronal* - *peripheral*, *anterior* (*front*) - *back* as is the common practice in phonology:

	labial	dental	velar
anterior	+	+	-
coronal	-	+	-

Figure 3-1. Distinctive features of consonantal phonemes of Classical Attic

[illegible]

Lupaş (1972:133) prefers Jakobson-Halle (1956) features:

	labial	dental	velar
compact	-	-	+
grave	+	-	+

Binary features permit a certain economy of statement in phonotactic descriptions. The fact that Attic permits the clusters *ps*, *pt*, *bd*, *p^ht^h*, *ks*, *kt*, *gd*, *k^ht^h* can be described in two ways:

i) Labial and velar obstruents cluster with homorganic dental obstruents.

ii) Peripheral (i.e. non-coronal) obstruents cluster with homorganic coronal obstruents.

However, the consistent use of binary features becomes inconvenient in many cases and I will be using also the traditional ternary features.

3.1.1.3 *Geminates*

The category of geminates was still a living category in Classical Attic. There are eleven geminates occurring intervocalically (all voiceless obstruents and sonorants have a 'long' counterpart). However, minimal pairs especially with obstruents are extremely rare - I cannot find any example of *p* : *pp*, *p^h* : *pp^h* and *k* : *kk^h*.

pp	pp ^h		mm		
tt	tt ^h	ss	nn	rr	ll
kk	kk ^h				

There is a considerable literature concerning the problem of the alternations between /tt/ and /ss/ in Classical Attic.¹ Both can be considered as phonemes (as a matter of fact only as subphonemes since they can contrast only intervocalically as all other geminates). As well-known, words with /tt/ occur in 'colloquial' Attic (inscriptions, comedy) while the same words show /ss/ in tragedy and prose works up to Thucydides:

inscriptions, comedy	prose works, tragedy	
θάλαττα	θάλασσα	'sea'
πράττω	πράσσω	'make'
τέτταρες	τέσσερες	'four'

The geminate /ss/ is of Ionic origin due to the fact that the literary Attic was under strong influence from Ionic (epic poetry, historiography) and we may simply assume that literary Attic borrowed this particular phoneme. That colloquial Attic was most likely totally unaffected by this borrowing is obvious if we compare Attic inscriptions (and comedy), which use /tt/ almost exclusively. Of course, there are some words with /ss/ even in comedy, but these can be explained as borrowings from tragedy: ἄνασσα 'queen', λεύσσω 'look'. (See

Lupaş (1972:37) and Allen (1974:11) for details.) Using our examples, a minimal pair of colloquial Attic like πλάττει : πλάττει did not exist in literary Attic and vice-versa a pair from literary Attic like πράσει : πράσσει was non-existent in colloquial Attic (where 'genuine' Attic πράττει would be used).

Lupaş (1972:114) decided to include geminate aspirates among the phonemes of Attic; however, there are no minimal pairs of non-aspirated versus aspirated geminate and I know only of one example of non-geminated versus geminated aspirate /t^h/ : /t^hh/:

τῦτθης	'nurse' (Gen)	-	τῦθης	'you put'
[tʰɪt ^h θ̥s]		-	[tʰɪt ^h θ̥s]	
ἔκχει	'pour out' (Imp)		ἔχει	'he has'
[ék ^h θ̥]			[ék ^h θ̥]	

The latter example involves a compound word: /k+k^h/ versus /k^h/.

For these reasons I have decided to exclude all geminated aspirates from the table of consonantal phonemes of Attic. It means that I will ignore the isolated pair /t^h/ : /t^hh/, because the gemination in τῦτθη 'nurse' is probably only expressive. On the other hand, I will include /pp/ among the Attic phonemes even if I do not know of a minimal pair /p/ : /pp/. This admittedly is an arbitrary treatment; however, it does not make any difference in our dialectal comparisons since /pp/ and /kk/ will figure in all dialectal inventories. See Bubeník (1976:164) for details.

There are isolated examples of the gemination of all obstruents in compound words or in external sandhi, mostly from Homeric dialect:

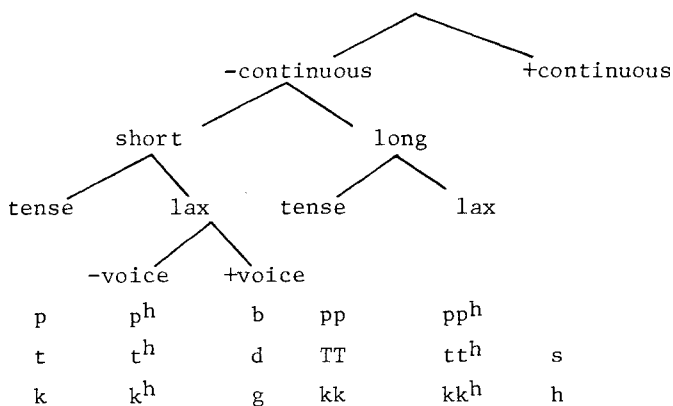
<u>Homeric</u>	/p+p/	κάππεσον	'I fell down' (= κατέπεσον)
	/p+p ^h /	καπφάλαρα	'cheek coverings' (= κατὰ φάλαρα)
	/t+t/	κατιάνυσαν	'they drew tight' (= κατετάνυσαν)
	/t+t ^h /	κάτθανον	'they died' (= κατέθανον)
<u>Attic</u>	/k+k/	ἐκκινέω	'move out of'
	/b+b/	κάββαλε	'he cast down' (= κατέβαλε)
	/d+d/	καδόῦσαι	'sink' (= καταδόῦσαι)
<u>Attic</u>	/g+g/	ἐκγονος	'child, offspring'

All examples taken from Homeric dialect result from the apocope of final /a/ in the preposition κατά (there is no evidence that another preposition μετά could undergo the apocope as well). Subsequently, the dental obstruent was assimilated completely to a following labial obstruent:

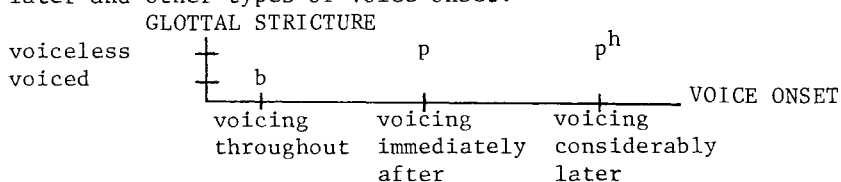
	kata+p	kata+b	kata+t	kata+d
<i>Syncopation</i>	kat+p	kat+b	kat+t	kat+d
<i>Voice Assimilation</i>	-	kad+b	-	kad+d
<i>Complete Assimilation</i>	kap+p	kab+b	-	-

3.1.1.4 Aspirates

According to Lupaş (1972:134) the opposition /p^h, pp^h, t^h, tt^h, k^h, kk^h/ vs /p, pp, t, tt, k, kk/ is *lax* vs *tense*. However, she regards the category *lax* - *tense* only as a sub-category of quantity (long - short). As she points out, the lack of tenseness is relative since geminates are generally more tense than the corresponding (voiceless) non-geminates. That is, if geminated aspirates /pp^h, tt^h, kk^h/ are classified as *lax* it does not mean that they are more *lax* than corresponding voiceless /p, t, k/, which are classified as *tense*. It only means that they are less tense than corresponding voiceless geminates /pp, TT, kk/. Lupaş's classification of Classical Attic obstruents is as follows:



For reasons mentioned in 1.3, p. 17 I consider such an analysis as incorrect and believe that there are no good reasons to depart from the traditional ternary classification based on two binary features (voiceless - voiced, unaspirated - aspirated). From the point of voice onset - the feature specified by Ladefoged (1971:19) - aspirated versus unaspirated is the opposition between voicing starting considerably later and other types of voice onset:



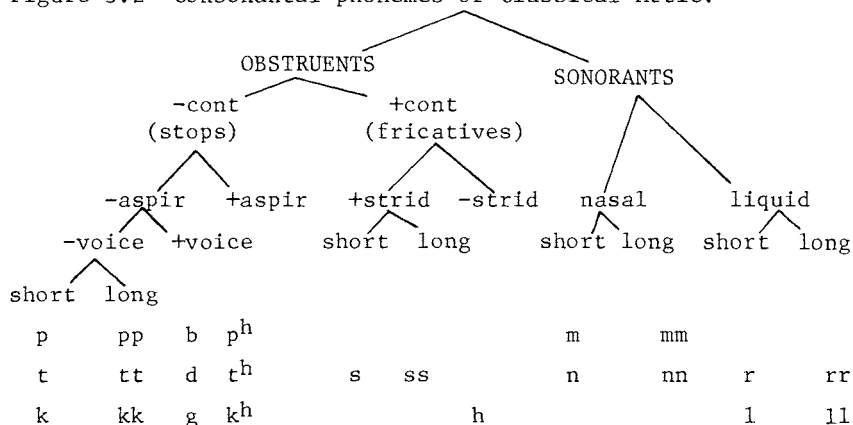
3.1.1.5 Continuants and Sonorants

The system of continuants was poor in all dialects. There was a sibilant /s/ (with a long counter-part in some dialects), glottal fricative /h/ and liquids /r/ and /l/.

I follow Ladefoged (1971:58) in using the term sonorant for liquids and nasals (= 'sounds with an auditory property which arises from their having a comparatively large amount of acoustic energy within a clearly defined formant structure'). In terms of articulatory phonetics, liquids possess both vocalic and consonantal features in that they 'combine closure and aperture either intermittently or by barring the median way and opening a lateral bypass', Jakobson et al. (1952:20). Nasals are articulated with a lowered velum; that is, their articulation combines the closure of the oral passage with the opening through the nose. There are only consonantal nasals in Ancient Greek dialects.

For the purpose of interdialectal comparisons the Classical Attic consonants will be presented by means of the following hierarchy of features:

Figure 3.2 Consonantal phonemes of Classical Attic.

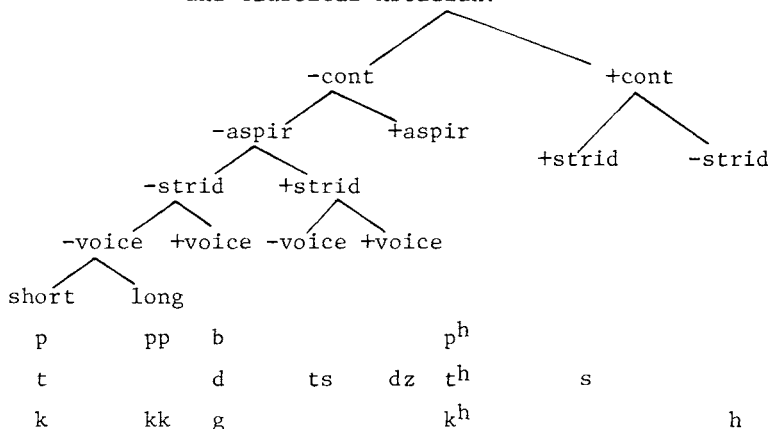


3.1.2 The Consonants of the Greek Dialects

The system of pre-Classical Attic-Ionic obstruents differed from its descendant by having two affricates. The term 'pre-Classical' refers to the period before the liquidation of a voiceless affricate /ts/ through assimilation (tt/ in Attic and /ss/ in Ionic) and before the metathesis of a voiced affricate *dz* → *zd*. In a system with two affricates the feature *strident* is necessary for a description of both stops and fricatives. It could well be that

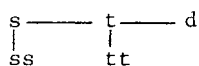
this system survived until Classical times in Arcadian (if our analysis of Arcadian data is correct, see 3.6, p. 118).

Figure 3-3. Consonantal phonemes of pre-Classical Attic and Classical Arcadian.



The phonological system of Boeotian and Central Cretan differed from other dialects in that the feature long was functional not only in voiceless but also in voiced stops. Boeotian has minimal pairs /tt/ : /dd/, μεττων 'middle' (Gen Pl) : μεδδων 'bigger' and /d/ : /dd/, μεδδων 'guardian' (a Homeric word which I use only for the sake of exemplification). The difference between Attic and Boeotian (and Central Cretan) in terms of their minimal pairs can be expressed thus:

Classical Attic



Boeotian, Central Cretan

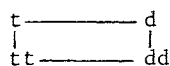
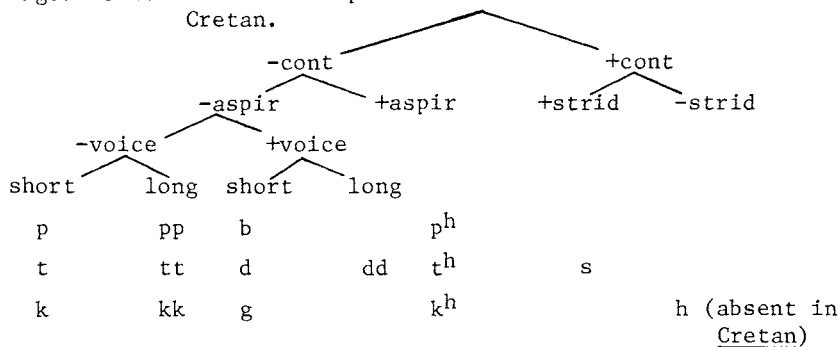
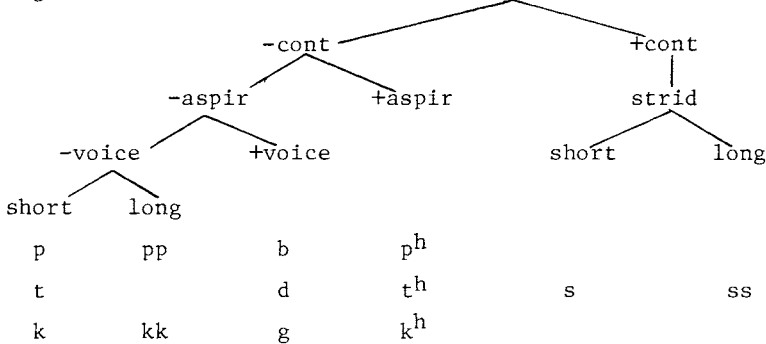


Figure 3-4. Consonantal phonemes of Boeotian and Central Cretan.



In Ionic and Lesbian the contrast of length with dental stops does not exist (their phonological system knows only /pp, /kk/ and /ss/). There is no glottal fricative.

Figure 3-5. Consonantal phonemes of Ionic and Lesbian.



3.1.3 Phonotactics of Classical Attic Consonants

3.1.3.1 Dyadic Clusters

Dyadic clusters of Classical Attic belong to one of four groups:

- | | | |
|-------|--|-------------------------------------|
| (I) | Obstruent + Obstruent | } occur both initially and medially |
| (II) | Obstruent + Sonorant | |
| (III) | Sonorant + Obstruent | } occur only medially |
| (IV) | {Sonorant
Sibilant} + {Sonorant
Fricative} | |

Clusters of type (I) and (II) occur both initially and medially. Those occurring only medially will be specified in the usual manner: *-gd-*; those occurring only across morpheme-boundaries will be marked with +.

Figure 3.6. Dyadic clusters (I) Obstruent + Obstruent

	pt	bd	ph ^t ^h	
	kt	-gd-	kh ^t ^h	
	k+p	k+b	k+p ^h	
	k+t	k+d	k+t ^h	k+s
	k+k	k/g+g	k+k ^h	
s+b	sp	zb	sp ^h	ps
s+d	st	zd	st ^h	
s+g	sk	-zg-	sk ^h	ks

These regularities of pattern can be observed:

- i) Labial and velar stops cluster with homorganic dental stops (or in binary features: peripheral stops cluster with

coronal stops) initially and medially, but *-gd-* occurs only medially.

ii) A voiceless velar stop clusters with all obstruents in compound words.

iii) Sibilants cluster with all homorganic stops (i.e. voiceless + voiceless, voiced + voiced, voiceless + aspirated) initially and medially, but *-zg-* occurs only medially.

iv) A voiceless sibilant clusters with voiced stops only in compound words.

v) Only *ps* and *ks* occur finally.

Figure 3-7. Dyadic clusters (II) Stop + Sonorant.

	pn	pr	pl
tm	-tn-	tr	tl
-km-	kn	kr	kl
		br	bl
dm	dn	dr	
-gm-	gn	gr	gl
	-p ^{hn} -	p ^{hr}	p ^{hl}
-t ^{hm} -	t ^{hn}	t ^{hr}	t ^{hl}
-k ^{hm} -	k ^{hn}	k ^{hr}	k ^{hl}

All stops cluster with sonorants both initially and medially. These clusters occur only medially:

i) Aspirates plus labial nasal (i.e. *t^{hm}*, *k^{hm}*) and *p^{hn}*.

ii) Velar stops plus labial nasal (i.e. *km*, *gm*, *k^{hm}*).

iii) A voiceless dental plus dental nasal. In some dialects *tn* could occur both initially and medially, since the cluster *t^{hn}* could be dissimilated /t^{hn}/ → [tn], see 3.2, p. 97.

Clusters of type (III) and (IV) occur only medially.

Figure 3-8. Dyadic clusters (III) Sonorant + Stop

-mp-	-rp-	-lp-
-nt-	-rt-	-lt-
-ŋk-	-rk-	-lk-
-mb-	-rb-	-lb-
-nd-	-rd-	-ld-
-ŋg-	-rg-	-lg-
-mp ^h -	-rp ^h -	-lp ^h -
-nt ^h -	-rt ^h -	-lt ^h -
-ŋk ^h -	-rk ^h -	-lk ^h -

$$\begin{array}{c}
 \text{(IV)} \left\{ \begin{array}{l} \text{Sonorant} \\ \text{Sibilant} \end{array} \right\} + \left\{ \begin{array}{l} \text{Sonorant} \\ \text{Fricative} \end{array} \right\} \\
 \begin{array}{ccc}
 (-)mn- & & \\
 -rm- & -rn- & -rs-
 \end{array}
 \end{array}$$

-lm-
(-)sm-

-ls-

- i) *mn* and *sm* also occur initially.
ii) The following clusters occur only in compound words:

n+h, *r+h*, *s+h* (and also *d+h*)
r+l, *s+n*, *s+r*, *s+l*.

Classical Attic does not permit the following clusters:

- a) Non-strident coronal stop + peripheral stop (*tp, *db, *thph; *tk, *dg, *thkh)
b) Peripheral stop + peripheral stop (*kp, *gb, *k^hph; *pk, *bg, *p^hkh with the exception of k+p in compound words).
c) Peripheral stop + strident (*k^hs, *gs; *p^hs, *bs with the exception of *ps* and *ks*)
d) Coronal stop + strident (*ts, *t^hs, *ds)
e) Labial stop + labial nasal (*pm, *bm, *p^hm)
Voiced labial stop + dental nasal (*bn)
f) Voiced dental stop + lateral liquid (*dl)
g) Nasal + liquid (*mr, *ml, *nr, *nl)
h) Lateral liquid + dental nasal (*ln)
i) Nasal + sibilant (*ms, *ns) but *n+s* does occur across morpheme-boundaries
k) Homorganic clusters: Dental + labial nasal (*nm) - but *mn* does occur initially and medially; lateral liquid + trill (*lr) - but *rl* occurs medially.

3.1.3.2 Triadic Clusters

Triadic Clusters of Ancient Greek² may be tabulated as in Figure 3-9. For the purpose of phonotactic patterning they may be studied as belonging to one of these four groups:

- (V) $\left\{ \begin{array}{l} \text{Sonorant} \\ \text{Sibilant} \\ \text{Velar Stop} \end{array} \right\} + \text{Peripheral Stop} + \text{Coronal Obstruent}$
(VI) Peripheral Stop + Coronal Stop + Trill
(VII) $\left\{ \begin{array}{l} \text{Sonorant} \\ \text{Sibilant} \\ \text{Velar Stop} \end{array} \right\} + \text{Stop} + \text{Sonorant}$
(VIII) $\left\{ \begin{array}{l} k \\ n, r \\ s \end{array} \right\} + \text{Sibilant} + \text{Stop}$

Figure 3-9. Triadic clusters of Ancient Greek

	p	b	p ^h	t	d	t ^h	k	g	k ^h	s
p				r						
k				r						+p+k+m
k ^h						r				
k/g+	tnrls	rl	t ^h rl	m	r	nrl	tnrls	rl	rl	pp ^h tdkk ^h
s	ls		r	r		ml	ls		nr	
s/z+	tnrls	drl	t ^h rl	r	r	nrl	tnrls	nrl	rl	pp ^h tdkk ^h
m/n/ŋ	ts	rl	t ^h	rl	r	r	tls		t ^h nr	
m/n/ŋ+	tnrls	drl	rl	mr	r	nrl	nrl	nrl	nrl	pp ^h tdkk ^h
r	tns		t ^h n	r	n	m	ts	m	t ^h n	
r+	tnrls	rl	rl	r	r	nr	rl		rl	pp ^h tdkk ^h
l	ts		t ^h	r			tms	m	t ^h	

Figure 3-10. Triadic clusters (V) $\left\{ \begin{array}{l} \text{Sonorant} \\ \text{Sibilant} \\ \text{Velar Stop} \end{array} \right\} + \text{Peripheral Stop} + \text{Coronal Obstruent}.$

mp+s	mp+t	mp ^h +t ^h	m+bd
rp+s	rp+t	rp ^h +t ^h	
lp+s	lp+t	lp ^h +t ^h	
s+ps	s+pt	s+p ^h t ^h	s/z+bd
k+ps	k+pt	k+p ^h t ^h	
ŋk+s	ŋk+t	ŋk ^h +t ^h	
rk+s	rk+t	rk ^h +t ^h	
lk+s	lk+t	lk ^h +t ^h	
s+ks	s+kt		
k+ks	k+kt		

i) Clusters of the type $\left\{ \begin{array}{l} \text{sibilant} \\ \text{velar stop} \end{array} \right\} + \text{peripheral stop} + \text{coronal obstruent}$ occur only in compound words.

ii) Only clusters of the type *sonorant + voiceless peripheral stop + voiceless coronal stop* occur in non-compound words (across morpheme-boundaries).

iii) Undocumented are: *r+bd, *k+bd, *s+k^ht^h, *k+k^ht^h, i.e. the prepositions ὑπέρ, ἐκ, πρὸς, δυσ-, εἰς do not combine with a handful of rare words with initial bd- (βδάλλω 'milk', βδελλίζω 'bleed with leeches', βδελύττομαι 'feel a loathing') and k^ht^h- (χθόνιος 'beneath the earth').

(VI) Greek does not permit clusters of the type *peripheral stop + coronal stop + $\left\{ \begin{array}{l} \text{nasal} \\ \text{lateral liquid} \end{array} \right\}$* .

Only two exceptions may be reconstructed in compound words:

ἐκθλίβω 'squeeze out' [ek^hthlībō], ἐκθνήσκω 'die out' [ek^hthnēskō]. See 3.2, p. 95.

The clusters of the type *peripheral stop + coronal stop + trill* are limited pt+r (or p+tr), kt+r and k^ht^h+r (e.g. σκῆπτρον 'staff', οἰκτρός 'pitiable', ἐχθρός 'enemy').

(VIII) See Figure 3-11.

i) Clusters of the type *trill + stop + sonorant* are quite common in non-compound words (rp+n, rp^hn, r+tr, rd+n, r+t^hm, r+t^hr, rg+m, rk^hn); on the other hand there are only three examples with l (lk+m, lg+m, l+tr, e.g. Ἀλκυμήν, ἐξημελγμένος 'milked out', φύλτρον 'love-charm').

Figure 3-11. Triadic Clusters (VII) $\left\{ \begin{array}{l} \text{Sonorant} \\ \text{Sibilant} \\ \text{Velar Stop} \end{array} \right\} + \text{Stop} + \text{Sonorant}$

m+pn			n+tm		n+t ^h _n	ŋ+kn	ŋ+gn	ŋk ^h _n
mpr	mbr	m+p ^h _r	ntr	ndr	nt ^h _r	ŋ+kr	ŋ+gr	ŋk ^h _r
mpl	mb1	m+p ^h ₁	ntl		n+t ^h ₁	ŋk1	ŋ+gl	ŋ+k ^h ₁
					r+t ^h _m			
rp+n		rp ^h _n		rd+n	r+t ^h _n	lk+ _m	l/rg+ _m	rk ^h _n
r+pr	r+br	r+p ^h _r	1/r+tr	r+dr	r+t ^h _r	r+kr		r+k ^h _r
r+p1	r+b1	r+p ^h ₁				r+k1		r+k ^h ₁
					st ^h _m			
s+pn					s+t ^h _n	s+kn	s/z+gn	sk ^h + _n
s+pr	s/z+br	sp ^h _r	str	s/z+dr	s+t ^h _r	s+kr	s/z+gr	sk ^h + _r
spl	s/z+b1	s+p ^h ₁	st1		st ^h ₁	sk1	s/z+gl	s+k ^h ₁
k+pn			k+tm		k+t ^h _n	k+kn		
k+pr	k+br	k+p ^h _r	kt+r	k+dr	k+t ^h _r	k+kr	g+gr	k+k ^h _r
k+p1	k+b1	k+p ^h ₁			k+t ^h ₁	k+k1	g+gl	k+k ^h ₁

Certain clusters in compound words are undocumented: *r+tm, *r+dn, *r+kn, *r+gn, *r+tl, *r+t^hl, *r+gl (the preposition ὑπέρ does not combine with verbs like κνάω 'scrape', γνάπτω 'bend', τλάω 'suffer', etc.).

ii) Clusters of the type *velar stop + stop + sonorant* exist only in compound words (with a single exception of kt+r). Undocumented are: *k+dm, *k+dn, *k+k^hn, *g+gn, *k+tl (the preposition ἐκ does not combine with verbs like δνοπαλίζω 'shake with', χναύω 'eat by little bits', δμηθεύς 'tamed', γνάπτω 'bend', etc.).

iii) Clusters of the type $\left\{ \begin{matrix} \text{dental nasal} \\ \text{sibilant} \end{matrix} \right\} + \text{dental stop} + \text{nasal}$ do not occur in non-compound words (*sth_m* in ἄσθμα 'panting' excepted). Only n+tm and n+t^hn are documented in compound words (the prepositions εἰς, πρὸς and ἐν do not combine with the infrequent words starting with tm, dm, dn, t^hn).

Figure 3-12. Triadic clusters (VIII) $\left\{ \begin{matrix} k \\ n, r \\ s \end{matrix} \right\} + \text{Sibilant} + \text{Obstruent}$

ks+tm	n+sb			
ks+p	k+sp	n+sp	r+sp	s+sp
	k+sp ^h	n+sp ^h	r+sp ^h	s+sp ^h
	k+st	n+st	r+st	s+st
	k+zd	n+zd	r+zd	s+zd
ks+k	k+sk	n+sk	r+sk	s+sk
	k+sk ^h	n+sk ^h	r+sk ^h	s+sk ^h

These clusters exist only in compound words with the boundary *before* the sibilant. The boundary is found also *after* the sibilant in three instances: ἔξιμέδμνος 'holding six medimni', ἑξακάδεκα 'sixteen' (= ἑκκαίδεκα), ἑξπηχυστί 'of six cubits'.

The following clusters are not found:

$$\left\{ \begin{matrix} k \\ n \\ r \\ s \end{matrix} \right\} + \text{Sibilant} + \left\{ \begin{matrix} \text{Voiced labial obstruent} \\ \text{Dental aspirate} \end{matrix} \right\}$$

The prepositions ἐκ; ἐν, σύν; ὑπέρ; πρὸς, δυσ-, εἰς do not combine with the words with initial sb- and st^h-. (An exception is found in Dioscorides ἐνσβέννυμαι 'to be quenched in').

3.2 PHONOLOGY OF ASPIRATES

3.2.1 *Phonotactics of Aspirates*

As is shown in Figures 3-6, 3-7 and 3-8, aspirates cluster only with aspirates, sibilants and sonorants. We may examine these three groups:

(I)	p ^h t ^h	s ^h p ^h	k+p ^h
		s ^h t ^h	k+t ^h
	k ^h t ^h	s ^h k ^h	k+k ^h
(II)	-p ^h n-	p ^h r	p ^h l
	-t ^h m-	t ^h r	t ^h l
	-k ^h m-	k ^h r	k ^h l
(III)	-m ^h -	-r ^h p-	-l ^h p-
	-n ^h -	-r ^h t-	-l ^h t-
	-ŋk ^h -	-r ^h k-	-l ^h k-

These regularities of pattern can be observed:

i) A cluster of two aspirates may be only of the types *peripheral + coronal*. Phonotactically impossible in Greek are clusters such as *coronal + peripheral aspirate* *t^hp^h, *t^hk^h (as is known such clusters exist in Georgian, e.g. t'it'k'mis 'almost') and clusters of two *peripheral aspirates* *p^hk^h, *k^hp^h (again possible in Georgian, e.g. p'k'vili 'flour'). It could be, however, that the cluster k^hp^h existed as a feature of external sandhi in cases like ἐκ φουλῆς [ek^hp^hulēs] (from the underlying /ek+p^hulēs/), see p. 98.

ii) Attic (like all other dialects) does not allow for the sequence *aspirate + sibilant*. (Similarly Modern Greek does not allow for the sequence *fricative + sibilant*).

γράφω, Fut *grap^h+sō → grapsō (deaspiration) 'I shall write'

τρέχω, Fut *trek^h+sō → t^hreksō (aspirate throw-back) 'I shall run'

The inventory of clusters *sibilant + aspirate* is thus poorer than the inventory of *sibilant + non-aspirate*:

sp ^h	st ^h	sk ^h	versus	sp	st	sk
				s/zb	s/zd	zg
∅	∅	∅				
∅	∅	∅		ps	ts*	ks
					dz*	

*/t^s/ and /d²/ existed as phonemes in Arcadian and Central Cretan.

iii) Aspirates form clusters with all sonorants under these restrictions: all aspirates form clusters with liquids both initially and medially; with nasals only medially. There are only a few exceptions to this:

t^h_n occurs initially only in θνήσκω 'die'

k^h_n occurs initially in two or three roots (χνοάζω 'get the first down', χνόη 'iron box of a wheel, nave', χναύω 'eat by little bits').

*p^h_m is not found

In some dialects clusters *aspirate + nasal* or *nasal + aspirate* + /r/ are sometimes spelled with *KN*, *TN*, *NTP* instead of *XN*, *ΘN*, *NΘP*:

<u>Locrian</u>	τεκνα 'art' (= τέχνη)
<u>Cretan</u>	τνατος 'mortal' (= θνητός)
	αντροπος 'man' (= άνθρωπος)
<u>Pamphylian</u>	ατροπος

If these spellings really correspond to the phonetic reality, they can be interpreted as demonstrating the *deaspiration* of an aspirate in the environment before a nasal (or after a nasal before a liquid).

iv) Sonorants form clusters with aspirates only medially.

v) Triadic clusters with two aspirates of the type *sonorant +*

$\begin{Bmatrix} \text{phth} \\ \text{khth} \end{Bmatrix}$ are quite common, see 3.1, Table (V). On the other hand clusters of the type $\begin{Bmatrix} \text{phth} \\ \text{khth} \end{Bmatrix} + \text{sonorant}$ are extremely rare. There is only one example of k^ht^hr in ἐχθρός 'enemy'. Notice, however, that clusters k^ht^hl and k^ht^hn can be reconstructed in internal sandhi, e.g. ἐκθλίβω 'squeeze out' [ekht^hlibō] from underlying /ek+t^hlibō/, ἐκθνήσκω 'die out' [ekht^hnskō] from underlying /ek+t^hnskō/.

There are two synchronic processes which can be identified on the basis of variation in the spelling of aspirates pre-vocalically or in clusters. These are metathesis and anticipation of aspiration.

Cretan καυχος [ka^hkhos] or [kav^hkhos] 'copper' (= χαλκός)

Ionic ἄχαντος 'acanthus' (= ἀκανθος)

Thessalian Πειθαλος 'Thessalian' (= Boeotian Φειταλος, Attic Θειταλός)

Attic ἐνθαῦθα 'here, there' (= ἐνταῦθα, Ionic ἐνθαῦτα)

	khakos	akanthos	phettalos	ent ^h auta
<i>Metathesis of aspiration</i>	ka ^h khos	ak ^h antos	pett ^h alos	enta ^h utha

In [ka^hkhos] aspiration is actually carried over and in

[ak^hantos] thrown back (cf. p. 96). Metathesis (with zero) is only a convenient label.

A phonetic reconstruction of the following examples is problematic:

Cretan θυθεμενος [t^hi^hemenos] 'placed' (= τυθέμενος)

θυκα [t^huk^ha] or [t^huka] 'fate' (= τύχη)

West Ionic (Cumae) θυφλος [t^hup^hlos] or [t^huplos] 'blind' (= τυφλός).

Arcadian παρθενος [p^harth^henos] 'virgin' (= παρθένος)

Cretan θυκα looks like the metathesis of aspiration [t^huka].

After the anticipation of aspiration in West Ionic [t^hup^hlos] even a deaspiration of an aspirate before a liquid could take place [t^huplos].

3.2.2 *Phonetic Reconstruction of Clusters φθ and χθ*

The phonetic reconstruction of these two clusters remains problematic. According to Allen (1974:25) there is no phonetic improbability about both consonants of the clusters φθ and χθ being aspirated:

ἐχθρός 'enemy' [ek^ht^hros]

ὀφθαλμός 'eye' [oph^ht^halmos]

These two examples represent inherited voiceless aspirate stops. On the other hand, labial or velar stops are regularly aspirated when they appear before the dental aspirate stop (as in the suffix of the Aorist Passive-^{thē} or in the suffix of the 2nd Pers Pl Perfect Middle -^{st^he}:

λείπω 'leave' ἐλείφθῃ

δέρκομαι 'see' ἐδέρχθῃ

πεφύλακται 'was guarded' πεφύλαχθε

Many linguists claim that the spellings φθ and χθ were mere conventions for unaspirated /p/ and /k/. This might seem a convenient explanation in the second case; thus we may phonemize:

leip-ō /eleīp-t^hēn/

derk-omai /edērk-t^hēn/

pephulak-tai *peph^hulak-st^he → /peph^hulak-t^he/

However, Allen rightly points out that this hypothesis is rather unlikely since in the geminate groups /pp^h/, /tt^h/, /kk^h/, where the first element was unaspirated, the spelling with Π, Τ, Κ is normal:

ἄπφϋς /app^hūs/ 'papa'

τῑτθῃ /titt^hē/ 'nurse'

κακχάζω /kakk^hadzō/ 'laugh aloud'

Recently, this problem was discussed by Lupaş (1972:16). According to her these spellings represent voiceless unaspirated lenis stops [p̥] and [k̥], which are allophones of

voiceless stops /p/ and /k/ in the environment before an aspirate or sibilant /s/.

According to this proposal the phonetic reality masked by the Attic spellings is the following:

φθόνος	[p̥thonos]	'malice'
ψῆφος	[ps̥p̥hos]	'pebble'
ἐκφέρω	[ekp̥herō]	'carry out'
ἐχθρός	[ekt̥hros]	'enemy'
ξένος	[ksenos]	'guest-friend'

This analysis is based on the observation that consonant clusters /ps/ and /ks/ were spelled in several ways before the adoption of the Ionic alphabet:

ps	ΠΣ	ΦΣ	<u>Ionic alphabet</u>	Ψ
ks	ΚΣ	ΧΣ		Ξ

This is supposed to indicate that their first element contained some special voiceless unaspirated stops; since they do not merge either with /p/, /k/ or with /p^h/, /k^h/ they are taken for voiceless lenis stops [p̥], [k̥]. In this proposal Lupaş followed Lejeune (1972:72), who discusses other details, like spellings ΧΣ alternating with ΗΣ in Amorgos and Naxos (7-6th c. B.C.), which seem to indicate the lax pronunciation of /k/ before /s/.

A certain arbitrariness of this solution is patent from the fact that it attributes the value of a lenis voiceless stop to [k̥] before a labial aspirate, but the value of a tense voiceless stop to [k] before a velar aspirate, e.g. ἐκχέω [ek^hēō] 'pour out'.³

On the other hand, the reconstruction of the lax [k̥] in clusters with non-homorganic aspirate seems to be supported by spellings like ἐχφέρειν, Ἐχφαντος, ἐχφορήσαντι,⁴ where we find Χφ instead of Κφ. The same spelling occurs also in the preposition ἐκ before aspirates and s; witness the following data from Attic inscriptions:

εχ	φυλεις	IG I ²	45.7	/ek+p̥hul̥̄s/
εχ	θετον	"	45.40	/ek+t̥ ^h et̥̄n/
εχ	Σαμο	"	304.20	/ek+sam̄̄/ 'from Samos'
εχς	Ροδο	"	218 I 11	/eks+rod̄̄/ 'from Rhodes'

If we examine both solutions closely it will become obvious that the controversy is more or less terminological. Lupaş postulates a 'lenition' (a voiceless velar or labial stop becomes lenis in the environment before a voiceless lax obstruent i.e. aspirate; notice that 'lenition' will not do in the case of *ps* and *ks* since Lupaş does not specify *s* for this feature). Allen postulates an 'assimilation in

aspiration' (i.e. assimilation in the manner of articulation, resulting from the contact of a voiceless labial or velar stop with a labial or dental aspirate):

Lupaş	Allen
[ek ^h p ^h ulē̄s]	[ek ^h p ^h ulē̄s]
[ek ^h t ^h etō̄n]	[ek ^h t ^h etō̄n]
[exsamō̄] or [ek ^h samō̄]	
[eksrodō̄] [ek ^h srodō̄]	

Since the phonetic reconstruction [ek^hsamō̄] and [ek^hsrodō̄] cannot be justified by the 'assimilation in aspiration' [eksamō̄] and [eksrodō̄] might be preferred. Notice that the spelling ἐχ in this case does not need to be taken as indicating either lenition or aspiration of /k/ before /s/. The same ἐχ occurred also before *k*, *p*, *t*, - according to Meisterhans-Schwyzler (1900:160), ἐχ before *k*, *p*, *t* was abandoned in favour of ἐκ after 292 B.C. - and it could be that the spelling ἐχ was simply a convention. (Similarly the spelling ἐκ is another convention, which indicates the phonetic value of /k/ in ἐκτείνω but not in ἐκγονος).

Let us examine some more complicated forms like ἐθάλπθη 'warm' (Aorist Passive of θάλπω), ἐθέλχθη 'enchant' (Aorist Passive of θέλω) and πρόσθεγμα 'address, salutation'.

<u>Lupaş</u>	<u>Allen</u>
[ethal ^h p ^h thē̄]	[ethalp ^h thē̄]
[ethel ^h kt ^h hē̄]	[ethelk ^h thē̄]
[prosp ^h t ^h hegma]	[prosp ^h t ^h hegma]

It can be argued that in colloquial Attic not everybody pronounced all three aspirates in ethalp^hthē̄ or both aspirates after /s/ in prosp^ht^hhegma. Even if such sequences certainly do not constitute a physiological impossibility in any actual languages, it could well be that speakers showing consistently both aspirates in [eleip^hthē̄] would quite naturally dissimilate the first aspirate in the cluster after another aspirate [ethalf^hthē̄]. Unfortunately, this statement implies that such speakers assimilated the final voiceless /p/ to a following aspirate /t^h/, and then dissimilated the resulting /p^h/ after the preceding /t^h/:

	ethalp+t ^h hē̄	eleip+t ^h hē̄
<i>Assimilation</i>	ethalp ^h thē̄	eleip ^h thē̄
<i>Dissimilation</i>	ethalf ^h thē̄	

So it is safer to claim, that in forms like *ethalpt^hē* the assimilation in the manner of articulation did not take place. In this sense, there is no controversy between the above hypotheses. Of course, one may still wonder why these two forms were spelled in the same way ἐθαλφθη and ἐλεϋθη, if the first was presumably pronounced [et^halpt^hē] and the second one [eleiph^hthē].

3.3 GRASSMANN'S LAW

The well-known phenomenon of 'Grassmann's Law' (1863), stating basically that the leftmost of the two nonadjacent aspirates is deaspirated, has been the subject of various controversies in recent publications. My intention is to show that much of this controversy is simply due to the neglect to distinguish carefully between synchronic and diachronic descriptions and between *historical* and *underlying* forms. These confusions were already to be found in the Neogrammarians and are simply perpetrated in much of the contemporary writings of generative phonologists.

The biggest error, expressed quite clearly, is that Grassmann's Law is a synchronic rule of Greek (and of Sanskrit). Thus Kiparsky (1973:115) derives synchronically *tí^ht^hēmi* from underlying *thí^ht^hēmi*, *tétroph^a* from *thēthroph^a*. Derivations like these are based on the Neogrammarian assumption that there are underlying diaspirate roots like **t^hrep^h* in Greek (or **bhudh* in Sanskrit). Consequently, the simple form of the Present *trép^hō* needs to undergo Grassmann's Law. This kind of reasoning is based on the observation of the occurrence of aspirates in forms like *trép^hō* (Present) and *t^hrepsō* (Future); hence by the simple cumulative method of Neogrammarian historical linguistics we obtain the underlying root *t^hrep^h*. The root-final aspirate is eliminated before *s* of the Future by a *Cluster rule* which deletes the aspiration immediately before obstruents. So according to Kiparsky the above two forms are derived like this:

	t ^h rep ^h ō	t ^h rephsō
<i>Cluster rule</i>	-	t ^h repsō
<i>Grassmann's Law</i>	trép ^h ō	-

Kiparsky then proceeds to formalize Grassmann's Law which is restricted by the fact that it does not operate across a morpheme boundary.⁵ The aspirate in the environment must be part of the root: that is, neither in Sanskrit nor in Greek does the aspirate in an ending have a dissimilatory effect on the aspirate in a root or in a prefix:

[-vocalic] $\longrightarrow$ [-aspirated] / $\frac{\quad}{\quad}$ X [+aspirated]

where X does not contain a + boundary.

This is supposed to explain why the initial segment of a double-aspirate root is not deaspirated when the ending begins with an aspirate. Thus the Passive Aorist *ethrēphēn* is safely derived from underlying *ethrēph^hēn* by applying the cluster rule, but not Grassmann's Law, which is blocked by the intervening morphemic boundary.

In connection with Grassmann's Law Kiparsky postulates another synchronic rule of Greek *s-Aspiration*, which turns *s* into *h* in sonorant environments:

$s \longrightarrow h / \left\{ \begin{array}{l} \text{---} \\ \text{---} \\ \text{---} \end{array} \right. \left\{ \begin{array}{l} \text{---} \\ \text{---} \\ \text{---} \end{array} \right. \text{[-obstruent]} \text{---}$ [-obstruent]

This 'synchronic' rule again is nothing more than a Neogrammarian account of forms like *ek^hō* (Present), *hek^sō* (Future): the root *sek^h*, which retains the *s* intact in the Aorist *ésk^hon* shows it as *h* in the future *héksō*; the underlying *sék^hō* becomes *hék^hō* by the *s-Aspiration* rule, and then *ék^hō* by Grassmann's Law. In other words, two historical sound changes stated as synchronic rules are necessary to account for the simple form of the present *ek^hō*. The derivations below are supposed to represent a synchronic process of Greek:

	thet ^h roph ^a	ethrep ^h thēn	threp ^h sō	sek ^h ō	sek ^h sō
<i>s-Aspiration</i>	-	-	-	hek ^h ō	hek ^h sō
<i>Cluster rule</i>	-	ethrept ^h hēn	threpsō	-	heksō
<i>Grassmann's Law</i>	tetroph ^a	-	-	ek ^h ō	-
	τέτροφα	ἐθρέφθην	θρέψω	ἔχω	ἔξω

Since in Greek dialects diaspirate and monoaspirate roots, e.g. /threp^h/ versus /treph/, never contrast, any PIE root /ChVch/ would be relexicalized as /CVCh/. (The same is true about Sanskrit, since both languages show a neutralization process called Grassmann's Law).

This assumption does away with both *s-Aspiration* and Grassmann's Law from the derivations above. All we need to derive these forms synchronically is to keep the Cluster Rule, which must be reformulated as 'aspirate throw-back', conditioned by the following /s/ or /th/:

	tetroph ^a	etrep ^h +thēn	treph ^h +sō	ek ^h ō	ek ^h +sō
<i>Aspirate</i>					
<i>Throw-back</i>	-	ethrep+thēn	threp+sō	-	hek+sō

Thus in my opinion all that is needed for synchronic

derivation is a) to assume *monoaspirate* underlying roots and
 b) to evaluate *synchronically* the alternations of the type *trep^hō* (Pres) *th^hrepsō* (Fut), without any Neo-grammairian bias.

As pointed out by Miller (1974:211) the 'aspirate throw-back' was a very irregular phenomenon, which takes place only if the consonant to which the aspiration is thrown back is a voiceless dental stop followed by /r/ (with exceptions), and also in a few isolated roots where there is only a voiceless dental stop followed by a vowel. There are no cases of 'aspirate throw-back' to a velar stop followed by /r/ or in a prevocalic position and only isolated examples of 'aspirate throw-back' to a bilabial stop before /r/:⁶

trep ^h ō	'nourish'	t ^h repsō	(Fut)	but	teuk ^h ō	'make'
					eteuksa	(Aorist)
trek ^h ō	'run'	t ^h reksō	(Fut)	but	trūk ^h ō	'waste'
					trūksō	(Fut)
trikhōs	(Gen Sg.)	t ^h riks	(Nom Sg.)			'hair'

Some isolated roots showing 'aspirate throw-back' are:

tūp ^h ō	'smoke'	t ^h ūpsai	(Aorist Inf)	Hesychius, Suidas
tak ^h us	'swift'	t ^h attōn	(Compar)	
etap ^h ē	(Aorist Pass)	t ^h aptō	'bury'	

There is no 'throw-back' in environments like:

ekrup ^h ē	(Aorist Pass)	kruptō	'hide'
pak ^h us	'thick'	passōn	(Compar) Homeric
ebap ^h ē	(Aorist Pass)	baptō	'dip in water'
eskap ^h ē	(Aorist Pass)	skaptō	'dig'
strep ^h ō	'turn'	strepsō	(Fut)

According to Miller (1974:214) 'aspirate throw-back' can be viewed only as a subrule of deaspiration. They are clearly the same synchronic process in the sense that they take place in the same environment - the contact of two continuous segments results in a manner dissimilation, where the first segment loses its aspiration:

Deaspiration [+ asp] → [- asp] / — [+ asp]

Under special circumstances in the roots trV $\begin{Bmatrix} p \\ k \end{Bmatrix}$ h, the aspiration is thrown back to the first consonant. The 'aspirate throw-back', furthermore, must be blocked if there

is an /s/ preceding /t(r)/: *strep^hō* 'turn' forms the Future *strepsō* (not **st^hrepsō*). This form is derived simply by de-aspiration from underlying *strep^hso*. Obviously, no 'aspirate throw-back' can take place if the first consonant of the root is a voiced stop, since there are no voiced aspirates in Greek.⁷

According to Kiparsky (1973:122) the spelling ΦΘ in ἐτρεφέθη does not indicate a cluster of two aspirates /p^ht^h/ but a cluster of the form non-aspirated stop + aspirated stop /pt^h/. I think that there are good reasons not to believe that this was the ordinary Greek convention. As pointed out by Allen it is difficult to see how such a convention could have come about, since in the geminate groups /pp^h, tt^h, kk^h/ the spelling ΠΦ, ΤΘ, ΚΧ is normal.

As a matter of fact, there is no point in insisting on the interpretation /pt^h/ since both /pt^h/ and /p^ht^h/ can be derived:

ἐτρεφέθη	'he was turned'	/etrept ^h ē/	or	/etrept ^h t ^h ē/
ἐτρεφθη	'he was nourished'	/et ^h rept ^h ē/	or	/et ^h rept ^h t ^h ē/
		trept ^h +sō	etrept ^h +t ^h ēn	etrept+t ^h ēn
Aspirate Throw-back		t ^h repsō	et ^h rept ^h ēn	-
Assimilation		-	et ^h rept ^h t ^h ēn	etrept ^h t ^h ēn

That Grassmann's Law is not a synchronic rule of Greek dialects but a historical rule can be seen in the derivational history of words like

ταχύς	'quick'	-	θάσσων (Comparative)	<u>Homeric</u>
ἐτάφην	(Aorist Pass)	-	θάπτω	'bury'

Here Grassmann's Law must be ordered before palatalization which certainly is not a synchronic rule. Compare the derivational history of these two words with ταχύς 'thick - πασσών (Comparative) Homeric:

		pak ^h jōn		
		pakjōn	tak ^h jōn	tap ^h jō
Grassman's Law		-	t ^h akjōn	t ^h apjō
Palatalization		pak' ^j jōn	t ^h ak' ^j jōn	t ^h ap' ^j jō
Affrication		pat's' ^j jōn	t ^h at's' ^j jōn	t ^h apt' ^j jō
Depalatalization		patsōn	t ^h atsōn	t ^h aptō
Regressive Assimilation		passōn	t ^h assōn	-

3.4 FRICATION OF CLASSICAL ASPIRATES

As shown by Modern Greek, the ancient aspirates /p^h/, /t^h/, /k^h/ changed into fricatives /f/, /θ/, /x/. The beginnings of this process of 'frication' are usually placed in the Greco-Roman period (starting circa 150 B.C.). However, certain spellings found in inscriptions from various dialectal areas seem to suggest that this process could have started much earlier in particular dialects. The best known examples are from the Laconian dialect. By the end of the 5th c. Attic writers (Aristophanes, Thucydides) transcribe Laconian /θ/ before vowels with Σ, e.g. σός (= Attic θεός 'god'), ἀγασός (= Attic ἀγαθός 'good'), and the same spelling occurs in inscriptions from Sparta, beginning in the 4th c., ἀνεσηκε (= Attic ἀνέθηκε 'dedicated'). This apparently indicates that speakers of Attic noticed the difference between their voiceless dental aspirate /t^h/ and its Laconian counterpart, which was probably a voiceless interdental fricative /θ/. Consequently, the spelling with Σ representing a voiceless sibilant /s/ in Attic, was more convenient than the spelling with θ since acoustically /s/ and /θ/ are closer (qua fricatives), than /s/ and /t^h/ (fricative versus aspirated stop). The same kind of reasoning can be applied to evaluation of Laconian inscriptions from the 4th c., if they are compared with older inscriptions, which show the spelling with θ consistently. We can assume that a certain generation of speakers of Laconian became aware that their pronunciation of prevocalic dental aspirate /t^h/ of the older generation changed in direction to interdental fricative /θ/; consequently they duly tried to express this phenomenon in their inscriptions and the letter Σ was found as the most suitable. What is interesting is that this spelling disappears from later inscriptions, and shows up again in very late inscriptions from the 2nd c. A.D. As was pointed out in the Introduction, this certainly represents a good example of the discrepancy between the literary and colloquial usage of dialect. The scribes simply noticed that the spelling with Σ was a kind of 'provincialism' (which was the best possible representation for /θ/!) but since it did not occur elsewhere they chose to avoid it. In other words, after the sound /t^h/ changed to /θ/, let us assume in the 4th c., it did not change back to /t^h/ as it might seem judging on the basis of later inscriptions, and again to /θ/ judging on the basis of very late inscriptions - the sound /θ/ became probably a new phoneme of Laconian and has been used ever since. More evidence from other dialects may be found in Buck (1955:59) and Lejeune (1972:61).

However, it might be wrong to assume that a full scale

frication of all aspirates affected Hellenistic Koine as early as the 2nd c. B.C., even if the beginnings of such a change can be traced to these times. Certainly, if we want to think of a historical sound change in terms of quantitative drift we can imagine that there appeared fricative allophones of old aspirates in certain environments; this relationship was reversed probably not earlier than in the 1st c. of the Christian era when for the first time the whole system was analyzable as containing voiceless stops versus voiceless fricatives (p , t , k versus f , θ , x). The positive evidence for a fricative pronunciation of all aspirates (p^h , t^h , k^h) is from the 1st c. A.D. in Pompeian spellings, Dafne (= Δάφνη), lasfe λασφη (for λάσθη 'mockery'), see Schwyzler (1938:158).

The environment for the frication of aspirates which comes most readily to mind is in the clusters $\varphi\theta$ and $\chi\theta$ / p^ht^h /, / k^ht^h /. These clusters could be affected first by the process of frication, and there could appear fricatives [fθ] and [xθ], first only as allophones of aspirates. What is meant by this is that it was perfectly possible for somebody to have an aspirate in prevocalic position in words like φαίδρός [phaidros] 'bright', and θεός [theos] 'god', but to have fricatives in a cluster ὀφθαλμός [ofthalmos] 'eye'. [f] in such a case would be considered only as an allophone of / p^h / and [θ] as an allophone of / t^h /. The same might be true about the clusters σφ, σθ, σχ / sp^h /, / st^h /, / sk^h /, which were quite difficult to pronounce (compare the situation in English, where /p/ in 'pit' is aspirated, but not /p/ in 'spit' - aspiration in English is, of course, only allophonic). A sequence *fricative* plus *aspirate* could be realized in two ways:

a) as a sequence *fricative* plus *stop* (= dissimilation in the manner of articulation): / st^h / → [st]

Evidence for this can be seen in early inscriptions of the West dialects: Elean χρεεσται (= χρῆσθαι), λυσαστο (= λυσάσθω) and even elsewhere, in Arcadian εσκεσθην, Lesbian υποσκεσθην vs. Homeric σχεθέειν 'hold'.

b) as a sequence *fricative* plus *fricative* (= assimilation in the manner of articulation): / st^h / → [sθ]

Inscriptional evidence can only be indirect since there was no grapheme for a voiceless interdental fricative [θ], so far as this sound only occurred as an allophone of an aspirate / t^h /. There are spellings like ΣΣ for Σθ found in late Elean (4 - 2nd c.) and spellings like ΘΘ for the same cluster found in Central Cretan:

<u>Elean</u>	αποδοσσαι	(= ἀποδόσθαι)
	ποληασσαι	(= πολήσασθαι)

<u>Central Cretan</u>	προθθα	(= πρόσθεν)
	αποφειπαθθα	(= ἀπειπάσθω)

Elean spellings can be interpreted as showing the fricative value of the second sound. In other words, a phoneme /t^h/ could be realized as an interdental fricative [θ] in the environment after /s/:

t^h → θ / s -

Given the inventory of Elean graphemes, the letter Σ would be the most suitable for this phonetic value. A counter-hypothesis might be a *complete assimilation* in the manner of articulation: st^h → st, which I think is to be ruled out on the basis of other data from Elean and other West dialects showing a *dissimilation* in the manner of articulation: st^h → st, since these two processes would be counter-acting:

<u>Locrian</u>	ηελεσται	(= ἐλέσθαι)
<u>Delphian</u>	προστα	(= πρόσθεν)
<u>Cretan</u>	μιστος	(= μισθός)
<u>Laconian</u>	χρησται	(= χρεῖσθαι)

The spelling θθ instead of Σθ is quite regular in Central Cretan and we find it also in Elean προθθα [prosθa] 'in front of'. On the other hand, there are also rare spellings with Tθ:

δεκετθα	(= δέχεσθαι)
χρητθα	(= χρεῖσθαι)
απολογιττετθω	(= ἀπολογιζέσθω)

If we take [dek^hesθai] for the most probable phonetic reconstruction it also appears that fricativity dissimilation sθ → tθ could take place and we may reconstruct [dek^hetθai], [k^hrētθai]. The situation is complicated by the fact that the spelling Σθ occurs also in the earliest inscriptions (in late inscriptions as well, here undoubtedly under the influence of Koine).

Summarizing the preceding discussion, we can assume that a long time before the change of aspirates into fricatives (taking place in the last pre-Christian and the first Christian century) Hellenistic Koine could have had fricative allophones [f], [θ], [x] of aspirate phonemes /p^h/, /t^h/, /k^h/ in certain environments such as clusters φθ and χθ after a sibilant /s/. Whoever wishes to view a historical sound-change in terms of a quantitative drift may claim that a historical process of frication started in these environments, and later on affected aspirates in other environments, namely the intervocalic position.

In terms of historical sound-change we can say that

fricative allophones of the aspirate phonemes, which occurred in the older type of Hellenistic Koine became phonemes in later Hellenistic Koine:

Hellenistic Koine

(before frication)

p	p ^h	[f]	b
t	t ^h	[θ]	d
k	k ^h	[x]	g

Hellenistic Koine

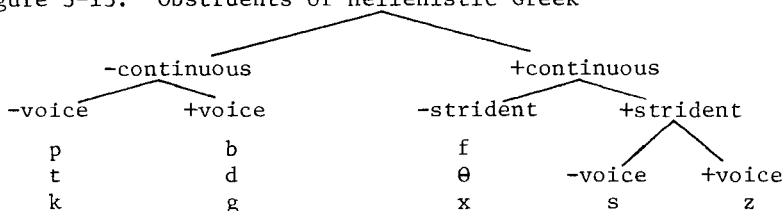
(after frication)

p	f	b
t	θ	d
k	x	g

It is more likely that the phonetic value of the fricative allophone of bilabial aspirate was also bilabial [ɸ], rather than labiodental [f]. The change $\phi \longrightarrow f$ took place later on, as is demonstrated by Modern Greek.

In terms of our phonological features we may say that the Classical Greek system *stop : aspirate : fricative* was transformed into a system based on a binary opposition *non-continuous : continuous*. The Hellenistic obstruents can be classified in this way:

Figure 3-13. Obstruents of Hellenistic Greek



It is more difficult to establish at what period the fricative pronunciation of the old voiced stops /b/, /d/, /g/ developed. Authorities differ more widely than in the case of frication of aspirates. According to Lejeune (1972:55) voiced stops remained unchanged in Koine and developed fricative values as late as in the Transitional Period from Old to Modern Greek (ca. 3rd - 6th c. A.D.). /b/ seems to be the first to develop the fricative value. Lejeune bases this claim on the observation that about the beginning of the Christian Era the Greek letter *B* could represent the Latin voiced labiodental fricative /v/, which was spelled with letter *U* in Latin:

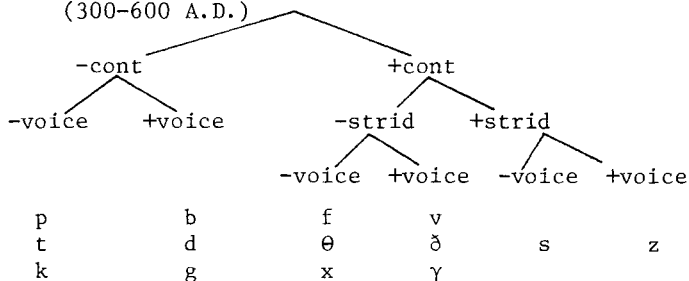
<u>Latin</u>	Flavius	[flavius]	<u>Greek</u>	Φλαουλος
			or	Φλαβλος

Whereas the first Greek rendering is a simple transliteration (Latin *U* = Greek *OY*), the second rendering need not be interpreted as evidence for a fricative value of Greek *B*.

since even if we assume that the phonetic value represented by this letter in Greek was a stop [b], this letter still would be the most fitting representation of Latin [v]. Again given the graphemic inventory of Greek, the only other possibility could be the letter Φ , which by these times represented a voiceless labiodental fricative [f]. This, however, was rightly refused, since anyone attempting a phonetic transcription of Latin in Greek characters considered *b* (voiced stop) a better transcription of *v* (voiced fricative) than *f* (voiceless fricative). In other words, a voice distinction was more important than the distinction in the manner of articulation.

In terms of our distinctive features, we may say that it was as late as in the Transitional Period (300-600 A.D.) that the opposition of voice became fully functional in continuants:

Figure 3-14. Obstruents of Greek of the Transitional Period (300-600 A.D.)



Again data from various dialects indicate that the process of frication could affect voiced stops much earlier than the suggested late period. In the later inscriptions of several Doric dialects (Cretan, Elean, Argolic and especially Laconian from the 4th to the 2nd c.), the old velar glide *w* spelled originally with digamma Φ (by these times *w* became labiodental fricative *v*) could now be spelled with β . This undoubtedly indicates that the letter β already represented a fricative [v] (or bilabial [β]) in certain environments and since then could be used interchangeably with digamma Φ :

<u>Laconian</u>	Βωρθεα or Βωρσεα beside Φωρθεα 'Orthia' (= 'Ορθία) [vōrθeā]
	προβειλπαῖας [proveipahās] 'having declared' (=προειπα(σα)ς)
<u>Cretan</u>	δολαβειπαμενος 'having conversed with' (=δολαειπάμενος)
<u>Elean</u>	βοικιαρ [voikiā] 'house' (=οἰκία Gen)

Sporadic omission of the letter Γ (or substitution of the letter ι) in certain words in various dialects may be

interpreted as showing that *g* started being pronounced as a velar fricative [ɣ] (or better, *g* developed fricative allophones intervocalically):

Boeotian (Aristophanes, Corinna) ἰώ(ν) 'I' (=ἐγώ)

Pamphylian μεῖαλαν 'big' (=μεγάλην Fem Acc)

Arcadian ἐπιθιλανε 'touch lightly' (=ἐπιθιγγάνη Subj)

various places (late) ὀλίος 'little' (=ὀλίγος)

Puzzling Cypriot spellings with the letter Z instead of Γ ζα 'earth' (=γῆ) αζαθος 'good' (=ἀγαθός) seem to indicate spontaneous palatalization of /g/ before a velar vowel: [dʒā], [adzathos].

3.5 DENTAL AND VELAR PALATALIZATION

Dental Palatalization - In Proto-Greek a dental obstruent /t/ in the environment before the palatal semivowel /j/ was palatalized. The palatalized dental obstruent was subsequently affricated *t'j* → *t's'j*; after the palatal glide had been lost this cluster was depalatalized *t's'j* → *ts*. At this stage Proto-Greek **tj* merges with Proto-Greek **ts*. The cluster *ts* could be subject to *progressive assimilation* in manner *ts* → *tt* (as in Boeotian, Attic and Central Cretan) or to *regressive assimilation* *ts* → *ss* (in other dialects).

Velar Palatalization - In Proto-Greek a velar obstruent /k/ in the environment before the palatal semivowel /j/ was palatalized. The palatalized velar obstruent was subsequently affricated *k'j* → *t's'j*. At this stage the Proto-Greek **kj* merges with Proto-Greek **tj* and all dialects with the exception of Attic-Ionic and Arcadian show the same reflexes for both **kj* (or *k^hj*) and **tj* (or *t^hj*):

	<i>*tj</i>	<i>*kj</i>
<i>Palatalization</i>	<i>t'j</i>	<i>k'j</i>
<i>Affrication</i>	<i>t's'j</i>	<i>t's'j</i>
<i>Depalatalization</i>	<i>ts</i>	<i>ts</i>
<i>Progressive Assimilation</i>	<i>tt</i>	<i>tt</i>
<i>Regressive Assimilation</i>	<i>ss</i>	<i>ss</i>

We may examine dialectal equivalents of Attic words μέσος 'middle', μέλιττα 'bee', and κηρύττω 'herald':

	<i>*methjos</i>	<i>*melitja</i>	<i>*kārujkō</i>
<u>Ionic</u>	μέσος	μέλισσα	κηρύσσω
<u>Arcadian</u>	μεσος		κᾱρυσσω
<u>Attic</u>	μέσος	μέλιττα	κηρύττω
<u>Lesbian</u>	μέσσος		κᾱρύσσω
<u>Central Cretan</u>	μεττος		
<u>Boeotian</u>	μεττος		κᾱρυττω

On the basis of reflexes of the Proto-Greek clusters **t(h)j*, **k(h)j* (and **tw*, **ts* and **ss*) Classical dialects may

conveniently be classified into three broad dialectal groups:

(a) On the one hand, Arcado-Cypriot and Ionic dialects (Southern group) show consistently a geminate sibilant /ss/ for Proto-Greek **k(h)y* and **tw* and a sibilant /s/ for Proto-Greek **ss*, **ts* and **t(h)j*.

(b) On the other hand, Aeolic and West dialects (Northern group) have only a geminate sibilant /ss/ for all these Proto-Greek clusters.

(c) Attica, Euboea and Boeotia represent transitional areas - Proto-Greek **k(h)j*, **tw* and partly even **tj* developed into a geminate dental obstruent /tt/. In Boeotian also the Proto-Greek **ts* gives the same result /tt/. According to Chadwick (1969:92) the geminate *tt* may have been a genuine Aeolism, surviving in Boeotian and extended to Attic,⁸ but eliminated partially in Thessalian and wholly in Lesbian. So far as Attic and Euboic are concerned, it could be that the difference in the development **t(h)j* had to do with the synchronic recoverability of *t(h)*. It was recoverable in words like μέλιττα, κρεῖττων 'stronger', πλάττω 'form' (since there were μέλιτος 'honey', κράτιστος 'strongest', κοροπλάθης 'modeller of small figures'); but it was not recoverable in words like μέσος or τόσος 'so much'.

Diverging developments of Proto-Greek **t(h)j* and **k(h)j* in these groups can be represented by the derivational scheme on p. 112.

The development of the voiced clusters **dj* and **gj* parallels to a certain point the development of **tj* and **kj* (both groups went through the affrication and depalatalization). However, the parallel development is completed (with progressive assimilation *dz* → *dd*, cf. *ts* → *tt*) only in Boeotian and Central Cretan. **dj* and **gj* developed in the same way also in Elean and Laconian (and maybe in Thessalian).

	<i>*djeus</i>	<i>*psāphidjō</i>	<i>*megjōn</i>	<i>*gwjōos</i>
		<i>*dikadjō</i>		
<u>Boeotian</u>	Δευσ	ψαφιδδω	μεδδονος	δωω
<u>Elean</u>		δικαδδω		
<u>Central</u>	Ζένυ (6-5th)	ψαφιδδω		ζδος (6-5th)
<u>Cretan</u>	Δηνα, (T)τηνα	δικαδδω		δδος (5-3rd)

Comparison of the derivation of Boeotian καρυττω and μεδδων:

	<u>Boeotian</u>	<u>Central Cretan</u>	<u>Elean</u>
	kārukjō	megjōn	dikadjō
<i>Palatalization</i>	kāruk'jō	meg'jōn	dikad'jō
<i>Affrication</i>	kārut's'jō	med'z'jōn	dikad'z'jō
<i>Depalatalization</i>	kārutsō	medzōn	dikadzō
<i>Progressive Assimilation</i>	kāruttō	meddōn	dikaddō

	(c) Transitional areas				(a) Southern group	(b) Northern group
	<u>Attic</u>	<u>West Ionic</u>	<u>Boeotian</u>		<u>Central and East Ionic Arcadian</u>	<u>Lesbian West Dialects</u>
<i>Palatalization</i>	_____		kārukjō	_____		
<i>Affrication</i>	_____		kāruk'jō	_____		
<i>Depalatalization</i>	_____		kārut's'jō	_____		
	_____		kārutsō	_____		
<i>Progressive Assimilation</i>	kāruttō	kāruttō	kāruttō	<i>Regressive</i>	kārusso	kārusso
<i>Fronting</i>	kāruttō	kāruttō	-		kārusso	-
<i>Raising</i>	kēruttō	kēruttō	-		kērussō	-
<i>Fronting</i>	kērüttō	-	-		-	-
			_____		methjos	_____
<i>Deaspiration</i>	melitja		_____		metjos	_____
<i>Palatalization</i>	melit'ja		_____		met'jos	_____
<i>Affrication</i>	melit's'ja		_____		met's'jos	_____
<i>Depalatalization</i>	melitsa		_____		metso	metso <u>Cretan</u>
<i>Progressive Assimilation</i>	melitta		metto	<i>Regressive</i>	messos	messos
<i>Degemination</i>	-		-		mesos	-

Elsewhere (in Attic-Ionic and Lesbian) the voiced affricate *dz* was metathesized *dz* → *zd* at quite an early date (it is impossible to specify more exactly at what time). For evidence regarding the Classical cluster *zd*, see under 3.1, p. 81. It is probable, however, that some dialects preserved the voiced affricate *dz* down to Classical times. The two most likely candidates are Arcadian and Central Cretan. The reason for the delayed metathesis of *dz* in Arcadian was apparently the fact that Arcadian had a voiceless counterpart /ts/ as a phoneme, consequently the voiced affricate had a support in the phonemic system, whereas elsewhere it was isolated. The same is true for the phonemic system of Central Cretan. Here also spellings like Ζένυ and ζῶος in the 6-5th c. indicate that /dz/ was not yet liquidated by the progressive assimilation, which apparently took place in Classical times, since the same words are spelled Δηνα, (Τ)τηνα and ὀδός in the 5-3rd c.

<u>Arcadian</u>	μεζων	/medzōn/	δικαζω	/dikadzō/
<u>Ionic</u>	μέζων	/mezdōn/	δικάζω	/dikazdō/
<u>Attic</u> ⁹	μεύζων	/mēzdzōn/	"	"
	megjōn		dikadjō	
<i>Palatalization</i>	meg'jōn		dikad'jō	
<i>Affrication</i>	med'z'jōn		dikad'z'jō	
<i>Depalatalization</i>	medzōn		dikadzō	
<i>Metathesis</i>	mezdōn		dikazdō	

As a result of the metathesis *dz* → *zd* the isoglosses linking the reflexes of **dj* and **gj* cut in a different way compared with the reflexes of **tj* and **kj*. This can be shown by the derivational history of **psap^hidjō*, p. 114.

A consequence of the convergent development of the Proto-Greek clusters **dj* and **gj* was a restructuring in underlying representations of verbal stems in voiced dental stop. In Western dialects, Arcado-Cypriot, Thessalian and Boeotian there are Future and Aorist forms in *-k+s-*, while the same verbs in Attic-Ionic form their Future and Aorist in *-s-* (*<ss<ts<ds>*). The extension *-k+s-* from the stems in velar stop to the stems in dental stop occurs sporadically even elsewhere, e.g. in Homeric πολεμύζομεν (versus Attic πολεμύσομεν), but it remains a characteristic phenomenon in the above dialects.

Attic

δικάζω 'judge' δικάσει versus δικαδῶ - δικασσει
Cretan

	(a) Southern group		(b) North-East	(c) Transi-	(b) some West
				tional	dialects
	<u>Ionic</u>				
	<u>Attic</u>	<u>Arcadian</u>	<u>Lesbian</u>	<u>Boeotian</u>	<u>Central Cretan</u>
					<u>Locrian</u>
					<u>Elean</u>
	_____		psāp ^h idjō	_____	
<i>Palatalization</i>	_____		psāp ^h id'jō	_____	
<i>Affrication</i>	_____		psāp ^h id'z'jō	_____	
<i>Depalatalization</i>	_____		psāp ^h idzō	_____	
<i>Progressive Assimilation</i>	-	-	-	psāp ^h iddō	psāp ^h iddō
<i>Fronting</i>	psāp ^h idzō	-	-		
<i>Raising</i>	psēp ^h idzō				
<i>Metathesis</i>	psēp ^h idzō	psāp ^h idzō	psāp ^h idzō		

κομίζω	'carry'	ἐκόμισα	versus	κομιδὼ	-	εκομισσα	<u>Boeotian</u>
ψηφίζομαι	'vote'	ἐψηφίσατο		φαφιδδομαι	-	εφαφίξατο	<u>Thessalian</u>

It seems hard to understand why the Proto-Greek cluster **tw* developed in the same way as **t(h)j* and **k(h)j* since generally only a palatal glide has a palatalizing and affricating effect. Allen (1973b:114) assumes that the palatalization of the Greek dental obstruent /t/ could be inherent and that this could lead to an assimilation of the velar /w/, via a front rounded [ɥ] to the palatal glide /j/. Lejeune (1972:66) explains the palatalization of /t/ before a velar /ɥ/ by "l'attaque prépalatale" of /u/ after a dental consonant: *tju* → *tɥu* → *su*. He also notices that the cluster **tw* is palatalized in dialectal groups where /t/ had the 'weakest' articulation and was generally 'assibilated' before /i/. Thus we can assume that the sequence of phonetic changes from Proto-Greek **tw* parallels the palatalization of **tj* and **kj*:

	tw		
<i>Assimilation</i>	t'ɥ	tj	kj
<i>Palatalization</i>	t'j	t'j	k'j
<i>Affrication</i>	t's'j	t's'j	t's'j
<i>Depalatalization</i>	ts	ts	ts
<i>Assimilation</i>	ss	ss	ss
<u>Attic-Ionic</u>	ἡμισυ	'half' (*sēmītu-) versus	<u>Cretan</u>
<u>Arcadian</u>	ἡμισυ		
<u>Lesbian</u>	αἰμισεων	(Gen Pl)	

Also its thematic doublet:

<u>Arcadian</u>	ἡμισσων (*sēmītwon)
<u>Thessalian, Delphian</u>	ἡμισσων
<u>East Cretan</u>	ἡμισσων

Personal Pronoun of the 2nd Sg:

	<u>Attic-Ionic, Lesbian</u>	versus	<u>Doric, Boeotian</u>
Nom	σύ		τυ
Dat	σοῦ, τοῦ (enclitic)		τυν
Acc	σέ		τε

Attic-Ionic and Lesbian σε must be derived from **twe* whereas Doric and Boeotian τε goes back to **te*; i.e. the velar glide was lost in West dialects but it was assimilated to the palatal /t/ elsewhere:

	<u>Arcadian</u> <u>Thessalian</u> <u>East Cretan</u>	<u>Attic-Ionic</u> <u>Lesbian</u>	<u>Doric</u> <u>Boeotian</u>
<i>Fricative Weakening</i>	sēmitwon		
<i>Assimilation</i>	hēmitwon	twe	twe
<i>Palatalization</i>	hēmit'ʰon	t'ʰe <i>w-Loss</i>	te
<i>Affrication</i>	hēmit'jon	t'je	
<i>Depalatalization</i>	hēmit's'jon	t's'je	
<i>Regressive Assimilation</i>	hēmitson	tse	
<i>Degemination</i>	hēmisson	sse	
	-	se	

Dialect reflexes of all Proto-Greek clusters discussed in 3.5 are surveyed in Figure 3-15.

3.6 REFLEXES OF PROTO-GREEK LABIOVELARS IN CLASSICAL DIALECTS

We may safely assume that Greek continued Proto-Indo-European labiovelars and that their labial and palatal development is a relatively recent phenomenon. This probably started in post-Mycenaean times since Mycenaean Greek has preserved the labiovelars as phonemes and the evidence for the labial development, typical above all of Classical Aeolic dialects, is insufficient in Mycenaean: see Vilborg (1960:46).

The evidence for labiovelars in Mycenaean is based on several words with plausible IE etymologies, which are written in Mycenaean with special syllabograms different from the graphemes for labial, dental and velar series:

<u>Mycenaean</u>	<u>Classical Attic</u>
a-to-ro-qo /antʰrōkwos/ 'man'	ἄνθρωπος /antʰrōpos/
qo-u-qo-ta /gʷougʷotās/ 'herdsman'	βουβότης /bōbotēs/

The following data from Mycenaean and Classical Greek dialects will illustrate the labial and palatal development of Proto-Greek labiovelars:

	*kʷis	*kʷēl	*kʷol-	*gʷel- / gʷol-
<u>Mycenaean</u>	kʷis	kʷēle-	ampʰikʷolos	
<u>Lesbian</u>		πῆλοθεν		
<u>Thessalian</u>	κῑς			βελλομαι
<u>Ionic</u>	τῑς	τηλόθεν	ἀμφιπόλος	βούλομαι
<u>Arcadian</u>	ῶς			
<u>West Dialects</u>				δηλομαι

Figure 3-15. Dialect geography of reflexes of Proto-Greek clusters *ss, *ts, *t(h)j, *k(h)j, *tw, *dj and *gj

	*ss	*ts	*t(h)j		*k(h)j	*tw	*dj	*gj
			s	ss			zd	
Ionic	s	s	s	ss	ss	ss	zd	
Arcadian	s	s	s	ss	ss	ss	dz	
Attic	s	s	s	tt	tt	tt	zd	
Boeotian	ss	tt	tt	tt	tt	tt	dd	
Lesbian	ss	ss	ss	ss	ss	ss	zd	
West Dialects (Laconian)	ss	ss	ss	ss	ss	ss	dd	
Central Cretan (6-5th)		ts	ts				dz	
Central Cretan (5-4th) ¹⁰		tt	tt	tt	tt		dd	

[After Lejeune (1972:106,112)]

According to Allen (1973:115) a probable phonetic development of Proto-Greek labiovelars in the environment before front vowels began with the palatalization of the labial feature to labio-palatal: $k^w \longrightarrow k^{\text{ɥ}}$, which entailed a fronting of the velar obstruent $k^{\text{ɥ}} \longrightarrow k'^{\text{ɥ}} \longrightarrow \text{ʃ}^{\text{ɥ}}$. This is supposed to be an essential stage since plain velar obstruents are not palatalized. In later development the labial component of the palatal affricate was lost.

In Arcado-Cypriot the affricate undergoes the same development as the affricate resulting from the dental and velar palatalization of Proto-Greek clusters $*t(h)j$ and $*k(h)j$, i.e. the palatal affricate was depalatalized $t's' \longrightarrow ts$, and the dental affricate could furthermore undergo a fricative development. The affricate stage is probably documented by Arcadian $\text{Ν}ϋς$ /t^sis/ 'who', written by the special grapheme of the Arcadian epichoric alphabet or by the diagraph TZ as in $\tau\zeta\epsilon\tau\rho\alpha\kappa\alpha\tau\iota\alpha\iota$ /t^setra-/ 'fourhundred' (Attic $\tau\epsilon\tau\rho\alpha\kappa\acute{o}\varsigma\iota\alpha\iota$).

In Cypriot the affricate lost its closure completely $\sigma\upsilon\varsigma$ /sis/ 'who'. Ionic dialects diverge at the affricate stage by losing the fricative component of the affricate. An interesting document is Thessalian $\kappa\upsilon\varsigma$ 'who', which can be interpreted in the sense that Thessalian lost the labial component of Proto-Greek /k^w/ before /i/ without undergoing the palatal development:

	<u>Arcado- Cypriot</u>	<u>Attic- Ionic</u>	<u>Thessalian</u>
<i>Palatalization</i>	k ^w is	k ^w is	k ^w is
<i>Affrication</i>	k' ^ɥ is	k' ^ɥ is	-
<i>Delabialization</i>	č ^ɥ is	č ^ɥ is	-
<i>Depalatalization</i>	čis	čis	kis
<i>Deaffrication</i>	t ^s is	t ^s is	
	sis	tis	

Proto-Greek voiced labiovelar $*g^w$ apparently underwent the same kind of development as the voiceless $*k^w$ in Arcado-Cypriot.

δellaω 'throw' (Hesychius ζέλλω), Attic-Ionic βάλλω

δερεθρον 'pit' (Strabo ζέρεθρον), Attic-Ionic βάραθρον

That the palatal development could take place even in West dialects is demonstrated by Heracleean δηλομαι, Delphian and Locrian δειλομαι which correspond to the forms with labial development of other dialects: Boeotian βειλομαι and Thessalian βελλομαι 'will, wish' (other dialects have a different root-vowel: Lesbian βολλαμαι, Cretan βωλομαι, Attic-Ionic βούλομαι).

	<u>Arcadian</u>	<u>West Dialects</u>
	g ^w el	g ^w el
<i>Palatalization</i>	g ^ʰ ʷel	g ^ʰ ʷel
<i>Affrication</i>	ʃʷel	ʃʷel
<i>Delabialization</i>	ʃel	ʃel
<i>Depalatalization</i>	d ^z el	d ^z el
<i>Deaffrication</i>	del	del
	<u>Boeotian</u>	<u>Lesbian</u>
	<u>Thessalian</u>	<u>Attic-Ionic</u>
	g ^w el	g ^w ol
<i>Labialization</i>	bel	bol

In Aeolic dialects Proto-Greek labiovelars in the environment before non-high vowels /e, o, a/ lost their velar component but kept their closure i.e. they are reflected as labial stops. The same happened in all other dialects in the environment before back non-high vowels /o, a/. A labial obstruent before a front vowel, where other dialects show a dental obstruent, is a distinct characteristic of the Aeolic dialects, e.g. Lesbian πῆλοθεν versus Attic τηλόθεν 'from afar'.

Proto-Greek labiovelars before a back round vowel /o/ could also be delabialized according to the evidence of various dialects, e.g. Mycenaean *g^woukolos*, Homeric βουκόλος 'cowherd' (versus Mycenaean *am^hikwolos*, Homeric ἀμφύπολος 'handmaid'); in the texts of Ionic authors there are forms κῶς 'how', κότερος 'which of two' (versus inscriptional and Attic πῶς, πότερος).

	<u>Aeolic</u>	<u>Ionic</u>
	k ^w ēlothēn	k ^w oteros
<i>Labialization</i>	pēlothēn	poteros (inscriptional)
	<u>Ionic</u>	
	k ^w ēlothēn	k ^w oteros
<i>Palatalization</i>	k ^ʰ ʷēlothēn	-
<i>Affrication</i>	ʃʷēlothēn	-
<i>Delabialization</i>	ʃēlothēn	koteros (literary)
<i>Depalatalization</i>	t ^s ēlothēn	
<i>Deaffrication</i>	tēlothēn	

There is some evidence for the reconstruction of Proto-Greek (or rather PIE) labiovelar /g^w/ in the environment before a dental nasal. Lejeune (1972:78) believes that the cluster -g^wn- existed in Mycenaean times. However, there is no direct evidence in LB texts and the reconstruction is guaranteed only by external evidence. Thus the labiovelar may be postulated for Proto-Greek ancestors of Classical

ἀμνός 'ram' (cf. Latin *agnus*), σεμνός 'revered' (cf. σέβομαι 'worship' and Sanskrit *tyaj-* 'abandon'), μνδομαι 'court' (cf. γυνή, Boeotian βανα). The labiovelar before /n/ was labialized (= lost its velar component) but the resulting cluster *bn did not survive anywhere in dialects (or expressed synchronically, in Greek a voiced bilabial stop does not cluster with nasals). The voiced bilabial stop was assimilated completely in the manner of articulation to the following dental nasal and became a bilabial nasal:

	ag ^w nos	tjeg ^w nos	g ^w na-
<i>Labialization</i>	abnos	sebnos	bna-
<i>Assimilation</i>	amnos	semnos	mna-

The derivational history of the word τέτταρες 'four' is quite complicated due to the variety of dialectal forms. The possibility of glide dissimilation in **k^wetwVr* must be taken into account. We need several proto-forms to account for all the dialectal variants: **k^wetwer*, **k^wetwar* and **k^wetwur*.

<u>Ionic</u>	τέσσερες	*k ^w etwer	
<u>Homeric</u>	τέσσαρες	} *k ^w etwar	<u>Arcadian</u> τετρα - /t ^s etra/
<u>Attic</u>	τέτταρες		
<u>Boeotian</u>	πετταρες		
<u>West dialects</u>	τετορες		
<u>Lesbian</u>	πέσυρες	} *k ^w etwur	
<u>Homeric</u>	πίσυρες		

A possible sequence of sound-changes (palatalization precedes the delabialization) to account for all the dialectal variants is given on p. 121.

3.7 DEVELOPMENT OF PROTO-GREEK SONORANT CLUSTERS IN CLASSICAL DIALECTS

The development of Proto-Greek sonorant clusters is particularly important for the classification of Classical dialects, especially for the establishing of a dichotomy between Aeolic (North-East group) and all other dialects. These clusters can be divided into four groups:

- (1) Sonorant + Sibilant: *ms, *ns, *rs, *ls, *ws
- (2) Sibilant + Sonorant: *sm, *sn, *sr, *sl, *sw
- (3) Lateral + Dental nasal: *ln
- (4) Sonorant + Palatal glide: *nj, *rj, *lj

See some data representative of the main groups of dialects:

- (1) Sonorant + Sibilant

	*ms	*ns	*rs	*ls
<u>Aeolic</u>	ἐνεμμα	ἐκριννα 'judged'		ἐστελλα
<u>Doric</u>		εφᾶνα	εκαθᾶρα	εστηλα

	<u>Ionic</u>	<u>Attic</u>	<u>West Dialects</u>	<u>Boeotian</u>	<u>Lesbian</u>
	k ^w etwer	k ^w etwar	k ^w etwor	k ^w etwar	k ^w etwur
<i>Glide Dissimilation</i>	k ^w etjer	k ^w etjar	k ^w etor	k ^w etjar	k ^w etjur
<i>Palatalization</i>	k'ɥet'jer	k'ɥet'jar	k'ɥetor	k ^w et'jar	k ^w et'jur
<i>Affrication</i>	čɥečer	čɥečar	čɥetor	k ^w ečer	k ^w ečur
<i>Delabialization</i>	čečer	čečar	četor	pečar	pečur
<i>Depalatalization</i>	t ^s et ^s er	t ^s et ^s ar	<u>Arcadian</u> t ^s etor	pet ^s ar	pet ^s ur
<i>Deaffrication</i>	tet ^s er	tet ^s ar	tetor	-	-
<i>Regressive Assimilation</i>	tesser	-	-	-	pessur
<i>Progressive Assimilation</i>	-	tettar	-	pettar	-
<i>Degemination</i>	-	-	-	-	pesur

<u>Ionic</u>	ἐνευμα	ἔφθηνα	ἐκάθηρα	ἔστειλα
	'I distributed'	'showed'	'cleansed'	'sent'

(2) Sibilant + Sonorant

	*sm	*sn	*sr	*sl
<u>Aeolic</u>	ἐμμυ	σελᾶννᾱ	χεῖρρας (Acc Pl)	χέλλου
<u>Doric</u>	ημυ	σελᾶνᾱ	χηρ	χηλίου
<u>Ionic</u>	εἰμύ	σελήνη	χεῖρ	χέλλου
	'I am'	'moon'	'hand'	'thousand'

(3) Lateral liquid + Dental nasal

	*ln
<u>Aeolic</u>	στάλλᾱ
<u>Doric</u>	στᾶλᾱ
<u>Ionic</u>	στήλη
	'stele'

(4) Sonorant + Palatal glide

	*nj	*rj	*lj
<u>Aeolic</u>	κτέννω	φθέρρω	στέλλω
<u>Ionic</u>	κτεύνω	φθεύρω	στέλλω
<u>Arcadian</u>		φθήρω	
	'kill'	'destroy'	'send'

(1) Sonorant + Sibilant

In Aeolic dialects a sibilant in the environment after a nasal or lateral liquid (there is no evidence regarding *rs) occurred subject to the *progressive sibilant assimilation*: A sibilant is assimilated completely to a preceding nasal or lateral liquid.

In other dialect groups a sibilant in the environment after a nasal or liquid was lost and the loss was accompanied by *compensatory lengthening* of the preceding vowel:

ŷ nasal s V → ṽ nasal V

Almost all of our examples are sigmatic Aorists.

	<u>Aeolic dialects</u>			
	enemsa	ekrinza	estelsa	
<i>Voice Assimilation</i>	enemza	ekrinza	estelza	
<i>Sibilant Assimilation</i>	enemma	ekrinna	estella	
	<u>Other dialect groups</u>			
	enemsa	ephansa	ekatharsa	estelsa
<i>Voice Assimilation</i>	enemza	ephanza	ekatharza	estelza
<i>Compensatory Lengthening</i>	enēma	ephāna	ekathāra	estēla <u>Doric</u>
<i>Fronting</i>		ephāna	ekathāra	-
<i>Raising</i>	enēma	ephēna	ekathēra	estēla <u>Ionic</u>

In Attic-Ionic, the clusters Sonorant + Sibilant in other

environments (not in the sigmatic Aorist) are treated differently. If *s* belongs to other inflectional and derivational morphemes it is never lost, but the preceding nasal can be lost and *r* can cause complete progressive assimilation of the following sibilant. Those morphemes include:

i) Dat Pl of athematic nouns *-si*

ποιμέσι 'shepherds' (< ποιμέν+σι)

ῥήτορ+σι 'public speakers'

ἅλ+σι 'lumps of salt'

The cluster *nts* is regularly simplified. /*n*/ is sometimes preserved in dialects, e.g. Arcadian ἡερομναμονσι 'ministers of religion'. The cluster *-ns-* is quite common here and can be of two other origins: **ntj/i* as in πανσα 'all' (Attic πᾶσα) and **nts* as in φερωνσι 'carrying' (Part) (Attic φέρουσι), see p. 201.

ἄλες is the only nominal stem in *-l*; there are also other forms of Dat Pl: ἄλεσσι (Homeric) and ἄλασι, where the cluster *-ls-* is 'avoided'.

ii) 2nd Sg Perf Middle *-sai*

πέφαν+σαι 'appear'

ἔσπαρ+σαι 'be scattered'

ἔσταλ+σαι 'be sent'

iii) Derivational suffix *-sis*

κλίσυς 'bending' (< κλύν+συς)

but θέρμαν+συς 'heating'

ἔγερ+συς 'awaking' (ἐγείρω)

ἄλ+συς 'leaping' (ἄλλομαι)

The cluster *nts* is exceptionally simplified in the environment after /*i*/. Thus there is κλίσυς, κρύσυς, 'decision' (κρίνω), but on the other hand θέρμαν+συς, πρᾶυν+συς 'appeasing'. *nts* is preserved in ἀπόφαν+συς 'declaration' (ἀποφαίνω) since it could be confused with ἀπόφασυς 'denial' (ἀπόφημι). Similarly there is a late ἔκφαν+συς 'making clear' (Synesius) versus ἔκφασυς 'declaration'. However, *nts* is not preserved in ἐπύφασυς or ἔμφασυς 'outward appearance' (-φαίνω).

In Homeric the clusters *lts*, *nts* in the Aorist remain unchanged:

κέλσαι 'drive in' (κέλλω)

ἔκερσεν 'shear' (κείρω)

ᾤρσε 'stir up' (ὀρνύμι)

In Attic the complete assimilation *rs* → *rz* → *rr* took place (unassimilated *rs* in early Attic writers is of Ionic origin):

Homeric ἄρσην 'male' Ionic ἔρσην versus Attic ἄρρην

Old Attic θάρσος 'courage' New Attic θάρρος

In Attic writers both *t^hars-* and *t^harr-* and metathesized *t^hras-* can be found.

	NOUN	VERB	ADJECTIVE	VERB
thars-	θάρος	θαρσέω	θαρσύς	θαρσύνω
tharr-	θάρος	θαρρέω	∅	θαρρύνω
thras-	θράσος	∅	θρασύς	θρασύνω

(2) Sibilant + Sonorant

In Aeolic dialects a sibilant in the environment before a nasal or liquid occurred subject to the *regressive sibilant assimilation*: A sibilant is assimilated completely to a following nasal or liquid.

In other dialect groups a sibilant in the environment before a nasal or liquid became a glottal fricative (as before a vowel). The glottal fricative was lost and the loss was accompanied by *compensatory lengthening* of a preceding vowel:

ǃ h Sonorant → ǃ Sonorant

Aeolic dialects

	esmi	selasnā	k ^h erras	k ^h eslioi
Voice Assimilation	ezmi	selaznā	k ^h ezras	k ^h ezlioi
Sibilant Assimilation	emmi	selannā	k ^h erras	k ^h elliui

other dialect groups

	esmi	selasnā	k ^h esr	k ^h eslioi
Voice Assimilation	ezmi	selaznā	k ^h ezr	k ^h ezlioi
Fricative Weakening	ehmi	selahnā	k ^h ehr	k ^h ehlioi
Compensatory Lengthening	ēmi	selānā	k ^h ēr	k ^h ēlioi <u>Doric</u>
Fronting	-	selēnā	-	-
Raising	ēmi	selēnē	k ^h ēr	k ^h ēlioi <u>Ionic</u>
Raising	-	-	-	k ^h īlioi <u>Attic</u>

In Attic there are quite a few examples of the cluster -nn- and only some of these go back to Proto-Greek *sn:

ζώννυμι	'gird' (*jōsnūmi)
σβέννυμι	'extinguish' (*sg ^{wes} nūmi)
ἐννύμι	'put clothes on' (*wesnūmi) <u>Homeric</u> εἴνυμι (hapax)

These forms underwent the 'Aeolic rule' of sibilant assimilation. Notice, however, that Homeric εἴνυμι shows the non-Aeolic development (fricative weakening and lengthening):

	<u>Homeric</u>	<u>Attic</u>
	wesnūmi	wesnūmi
Voice Assimilation	weznūmi	weznūmi
Fricative Weakening	wehnūmi	wennūmi
Lengthening	wēnūmi	
Raising	wēnūmi	

Other Attic forms like μερνύμι 'mix', στροέννυμι

'spread' (older form στόρνυμι) may be explained as having been formed recently from the stems in -s (Aorist, Future):

στόρνυμι < *stor+nūmi
στορέννυμι < stores+nūmi

It seems that in Aeolic dialects the sibilant could undergo sibilant assimilation even before a velar glide:

Lesbian (gloss) εὐέθωκεν probably [ew(w)ét^hoken]

Ionic ἔωθα

Homeric, Attic εῴθα

Aeolic

sesweth^h-

hesweth^h-

hezweh^h-

hewweh^h-

ewweh^h-

Fricative Weakening

Voice Assimilation

Sibilant Assimilation

Psilosis

In other dialects a sibilant before a velar glide underwent the 'regular' development.

Cretan τελνος 'perfect' (*teles+wos), Attic-Ionic τέλεος
(<*teles+jos)

East Aegean Doric (Cos) τελεως

Homeric, Attic

seswōt^ha

sezwōt^ha

hehwōt^ha

ēwōt^ha

ēōt^ha

Doric

teleswos

telezwos

telehwos

telēwos

telēos

(Cretan)

Raising

ēōt^ha *Metathesis of length* teleōs (Cos)

(3) Lateral liquid + Dental nasal

In Aeolic dialects a dental nasal in the environment after a lateral liquid (there is no evidence regarding **rn*) occurred subject to the *nasal assimilation*: A dental nasal is assimilated completely to the preceding lateral liquid.

In other dialect groups a lateral liquid in the environment before a dental nasal was lost and the loss was accompanied by a *compensatory lengthening* of a preceding vowel:

ŷ l n V → $\bar{V}$ n V

Aeolic dialects

stalnā op^helnō bolnā

stallā op^hellō bollā

Nasal Assimilation

other dialect groups

stalnā op^helnō bolnā

<i>Compensatory Lengthening</i>	stālā	ophēlō	bōlā	<u>Doric</u>
<i>Fronting</i>	stālā̃	-	bōlā̃	
<i>Raising</i>	stēlē	ophēlē	bōlē	<u>Ionic</u>

Note: We do not know if Aeolic βολλᾶ goes back to Proto-Greek *bolnā or *bolsā.

Attic form (ἀπ)όλλυμι 'destroy' shows the Aeolic development through the nasal assimilation from *olnūmi → olūmi (instead of predicted *ōlūmi).

- (4) {Dental nasal}
 {Liquid} + Palatal glide

In Aeolic dialects a palatal glide is assimilated completely to a preceding liquid or a dental nasal in the environment after front and high back vowels /i, e, u/. A *glide assimilation* restricted to the environment after a lateral liquid is common to all dialects (with exceptions found in Cypriot and Elean).

In all dialects a *metathesis* of palatal glide in the case of clusters *rj and *nj took place. The metathesis in Aeolic dialects took place only after back non-high vowels /o, a/.

Metathesis: $V \begin{Bmatrix} r \\ n \end{Bmatrix} j V \longrightarrow V i \begin{Bmatrix} r \\ n \end{Bmatrix} V$

Aeolic dialects

Glide Assimilation ktenjō ph^ht^hherjō
 ktennō ph^ht^hherrō

all dialects

(with the exception
of Aeolic)

all dialects

Metathesis of glide ktenjō ph^ht^hherjō banjō morja
 kteinō ph^ht^hheirō bainō moira

all dialects

Glide Assimilation aljos steljō
 allos stellō

In Cypriot and Elean there is some scanty evidence that the metathesis of palatal glide could take place even in the case of the cluster *lj:

Cypriot αἰλος 'another' (elsewhere in Doric αλλος)

Ἀπελων 'Apollo' (Doric 'Ἀπέλων)

Elean αἰλοτριᾶ 'alien' (= ἄλλοτριᾶ)

Cypriot, Elean

Metathesis of glide aljos apeljōn
 ailos apeilōn

	<u>other Doric dialects</u>	
	aljos	apeljōn
<i>Assimilation of glide</i>	allos	apellōn

An item of direct evidence for a non-metathesized cluster -rj- comes from Mycenaean spellings with syllabograms ra₂ /rja/ and ro₂ /rjo/ in words like a-ro₂-e /arjohes/ 'better' (cf. Superlative ἄριστος), tu-ro₂ /turjos/ 'cheese' (Diminutive, cf. τῦρός). See Lejeune (1972:156).

Another solution instead of metathesis of palatal glide would be to assume compensatory lengthening, as in (1), (2) and (3), with the loss of palatal glide:

	ktenjō	ph ^h therjō	
<i>Compensatory Lengthening</i>	ktēnō	ph ^h therō	Arcadian φθηρω
<i>Raising</i>	ktēnō	ph ^h thērō	Attic-Ionic φθεῖρω

The result is the same in both cases since phonologically /ē/ = [ē] ~ [ei]. However, this solution may be regarded as preferable in the case of high vowels: *urjV (no evidence for *irjV)

<u>Aeolic</u>	ὀλοφύρρω	'lament'
<u>Attic-Ionic</u>	ὀλοφύρομαι	

	<u>Aeolic</u>		<u>Attic-Ionic</u>
	oloph ^h urjō		oloph ^h urjomai
<i>Glide Assimilation</i>	oloph ^h urrō	<i>Compensatory Lengthening</i>	oloph ^h ūromai

NOTES

- 1 In Lupas's analysis (1972:144ff) phonemes /tt/ and /ss/ are interpreted as stylistic variants of a single archiphoneme /TT/. The archiphoneme /TT/ is realized as [ss] in elevated style (tragedy) and [tt] in colloquial style (comedy and inscriptions). She proposes to indicate the presence of elevated style [+emph] as a triggering device for the phoneme /ss/. In the absence of this mark the archiphoneme /TT/ is realized as [tt].
- 2 Lupas's corpus is not representative of Classical Attic in the sense that she did not include any prose (it includes only the three great tragedians, Aristophanes, and inscriptions from the same time published in IG I²). For a description of the phonotactics even the time limit seems to be detrimental since if we include writers of the 4th c. (Plato, Aristotle, Xenophon, Theophrastus, Demosthenes) we can add to her triadic clusters examples like: s+kt,

k+ks, n+tm, n+t^hl, r+b^l, r+r^kh^r, s+kn, s+gl, k+p^hl, k+tm, k+t^hl, k+kn, k+kr, k+kl, g+gl, k+k^hr, k+sk^h, r+sk, s+sp, ks+p. Many other clusters can be found in authors of Hellenistic and Graeco-Roman period. I included even those in order to obtain a more exhaustive picture of the phonotactics of Ancient Greek.

The following clusters are not found in Lupaş's corpus (1972:138):

$\left\{ \begin{array}{l} \text{Sibilant} \\ \text{Velar Stop} \end{array} \right\} + \text{Peripheral Stop} + \text{Coronal Obstruent}$

s/z+bd	εἰσβδάλλω	Galen
k + ps	ἐκψύω	Hippocrates
s + kt	προσκητάομαι	Xenophon
k + ks	ἐκσυλόομαι	Theophrastus
k + kt	ἐκτυπέω	Pollux

$\left\{ \begin{array}{l} \text{Sonorant} \\ \text{Sibilant} \\ \text{Velar Stop} \end{array} \right\} + \text{Obstruent} + \text{Sonorant}$

n+tm	ἐντημα	Xenophon
n+t ^h l	ἐνθλίβω	Aristotle
η+kn	ἐκνώσσω	Moschus (200 B.C.)
r+pr	ὑπερπράξιον	C.I.
r+b ^l	ὑπερβλαστής	Theophrastus
r+p ^h l	ὑπερφλεγµαίνω	Hippocrates
r+kr	ὑπερκρεµάννυμι	Pindar
r+kl	ὑπερκλύζω	Strabo
r+k ^h r	ὑπερχρεως	Demosthenes
s/z+br	προσβρέχω	Hippocrates
s+p ^h l	ἐσφλάω	"
s+kn	προσκηνάομαι	Xenophon
s/z+gl	προσγλίχομαι	Aristotle
k+p ^h l	ἐκφλέγω	Atistophanes
k+tm	ἐκτμησις	Aristotle
k+t ^h l	ἐκθλίβω	"
k+kn	ἐκκνάω	Herodotus
k+kr	ἐκκρέµαται	Plato
k+kl	ἐκκλίνω	"
g+gl	ἐγγλύφω	"
k+k ^h r	ἐκχράω	Sophocles
k+k ^h l	ἐκχλοομαι	Hippocrates

$\left\{ \begin{array}{l} k \\ n, r \\ s \end{array} \right\} + \text{Sibilant} + \text{Obstruent}$

k+sp ^h	ἐκσφραγίζομαι	Euripides
k+sk ^h	ἐκσχίζω	Aristotle

n+sb	ἐνσβέννυμαι	Dioscorides
n+sp ^h	ἐνσφηνόδομαι	Dioscorides
r+sp	ὑπερσπουδάζω	Lucian
r+sp ^h	ὑπερσφριγάζω	Gregorius Nyssenens
r+sk	ὑπερσκελής	Plato
s+sp	προσσπάομαι	Aristotle
s+sp ^h	προσσφάζω	Plutarchus
s+zd	προσζεύγνυμι	Lucian
s+sk	προσσκοπέω	Strabo
s+sk ^h	προσσχεδιδάζω	Josephus
ks+k	ἐξακίδεκα	Phrynichus
ks+p	ἐξπηχυστί	Sophocles

- 3 In her phonological analysis Lupaş (p. 109) notes correctly that the lenis allophones [p̥k] appear only in the context which does not tolerate the presence of [p b p^h k g k^h] (i.e. the opposition voiceless: voiced: aspirate is neutralized before [s] and [t^h]). And this induces the tantalizing question for any structuralist - to which phonemes should the lenis allophones [p̥k] be assigned? They resemble /p^hk^h/ in being voiceless and lax, /p k/ in being voiceless and finally /b g/ in being lax. Since there is no criterion available, she prefers to set up two archiphonemes /P K/.

In a more dynamic theoretical framework which allows for low-level phonological rules the problem of setting up an archiphoneme in similar circumstances would not arise. Furthermore, it is possible to analyze Ancient Greek without the feature tense-lax which forced Lupaş to set up an archiphoneme. Lupaş's analysis:

/p^hk^h/ -voice, -tense
 /p k/ -voice, +tense
 /b g/ +voice, -tense

Traditional analysis (adopted in the present monograph):

/p^hk^h/ -voice, +aspirated
 /p k/ -voice, -aspirated
 /b g/ +voice, -aspirated

Thus in my analysis [p̥] in [graps̥] etc. is assigned automatically to /p/ with which it shares two features (-voice, -aspirated) and the relationship of [p̥] and /p/ is of course captured by a low-level phonological rule:

/p/ → [p̥]/ — [s].

- 4 But there are also spellings Ἐκφαντος, ἐκφορῶς. All these examples are taken from Dow (1967:213).
- 5 There are quite a few exceptions showing that the deaspiration of the leftmost aspirate could operate across a morpheme boundary; however, they comprise mostly personal names where it can be argued that the morpheme boundary is lost. Examples given by Schwyzler (1939:261):

Delos ἀρχεθέρως 'chief ambassador' (= ἀρχεθέρως)
 κρεοφυλάκιον 'the office in which the register of
 public debtors is kept'
 (= χρεοφυλάκιον)

Εκεσθενής

<u>Aetolian</u>	Αρχεφωv
<u>Delphian, Laconian</u>	Εκεφυλος
<u>Cretan</u>	Τευφυλος
<u>Attic</u>	Κρυσόθεμυς
	Πωσφόρος
	'Αντεσφόρος

An aspirate in the ending does not have a dissimilatory effect on the aspirate in the root; however, the opposite phenomenon of progressive dissimilation is sometimes observed:

σώθητι (Aorist Pass) not *σώτηθι (< *sōt^hē+t^hi)
 ἐπιστράφητι (LXX) (< *epi^hstraph^hē+t^hi)
 but γράφηθι (< *grap^hē+t^hi)

	k ^h reophulakion	sōthēthi	graphēthi
<i>Regressive Dissimilation</i>	kreophulakion	-	-
<i>Progressive Dissimilation</i>	-	sōthēti	

6 Those examples are:

φροῦδος 'gone, departed' (< προ + ὄδοῦ)
 φρουρός 'watcher, guard' (< προ + ὄράω)
 φροῦμιον 'opening, introduction' (< προοῖμιον, ὄμιος 'road, path')

	pro+horos	pro+hodos
<i>Aspirate Throw-Back</i>	p ^h ro+oros	p ^h ro+odos
<i>Contraction</i>	p ^h rōros	p ^h rōdos

7 The 'aspirate throw-back' rule is quite a costly mini-rule which captures the 'regularity' in behaviour of not more than a handful of forms. Two verbs: τρέφω 'nourish' and τρέχω 'run' (but there are also the forms δραμοῦμαι (Fut) and ἔδραμον (Aorist) and the isolated noun θρύξ 'hair', plus the three other above mentioned isolated forms. The rule has been formalized by Miller as follows:

Aspirate Throw-Back

$$\# \begin{bmatrix} +\text{obst} \\ +\text{cor} \\ -\text{cont} \\ -\text{asp} \end{bmatrix} \quad (r) \quad \vee \quad \begin{bmatrix} +\text{obst} \\ +\text{asp} \end{bmatrix} + \begin{bmatrix} +\text{obst} \\ -\text{asp} \end{bmatrix} \Rightarrow_1 \begin{bmatrix} 2 \\ +\text{asp} \end{bmatrix} \langle 3 \rangle_4 \begin{bmatrix} 5 \\ -\text{asp} \end{bmatrix} 6 \quad 7$$

1 2 <3> 4 5 6 7

Of course, relevant roots must be marked in the lexicon for undergoing this subrule. Where /r/ is present, the subrule

will apply normally; and a rule will be needed to interpret the lexical marks: M for /tVCh/ means that the subrule applies, U means it does not apply; and the same marks for /trVCh/.

- 8 Chadwick (1969:92) regards Attic as a mixed dialect in the sub-Mycenean period. The evidence seems to be the cultural unity of the Cycladic area and Eastern Attica, which suggests that the Eastern Attic was a dialect identical with Cycladic (= Proto-Ionic), while Western Attic was a different dialect, influenced by a dialect of the Boeotian type.
- 9 According to Lejeune (1972:113) 'le vocalisme de l'attique μέζων comme celui de κρείττων est analogique et a été introduit secondairement dans la vulgate homérique'. The source of analogy is supposed to be the comparative χείρων 'worse' - however, no cogent reasons are given to believe that this was really the case.

<u>Ionic</u>	κρέσσων	<u>Attic</u>	κρείττων
	μέζων		μέζων
			χείρων
			ὀλέζων

This kind of conceptual analogy of course cannot be ruled out a priori; nevertheless it could be that the forms κρείττων and μέζων represent non-analogical formations, since depalatalization of the cluster $t's'j \longrightarrow t^s$ could be preceded by the metathesis of the palatal glide:

	kretjōn	megjon
<i>Palatalization</i>	kret'jōn	meg'jōn
<i>Affrication</i>	kret's'jōn	med'z'jōn
<i>Metathesis of glide</i>	kreit's'ōn	meid'z'ōn
<i>Depalatalization</i>	kreit ^s ōn	meidzōn
<i>Assimilation</i>	kreittōn	-
<i>Metathesis</i>	-	meizdōn

- 10 There are various difficulties connected with the phonetic reconstruction of Central Cretan reflexes of Proto-Greek clusters $*ts$, $*t(h)j$ and $*k(h)j$; those spellings of θθ occurring between the 4th - 2nd c are especially hard to explain.

	<u>Central Cretan</u>				
Proto-Greek	*ss	*ts	*t(h)j	*k(h)j	*tw
6-5th c.	?	δαζαθαυ	οζου	?	?
			μεζατος		
5-4th c.	?	δατταθθαυ	οποττου	φυλαττην	?
			μεπτον	φυλαδην	
			ιατταν (East Cretan)		
4-2nd c.			οθθακιν	?	ημιτθον
	φετεθθυ	Αρκαθθυ	υαθθαν		ημισσον
					(East Cretan)

Probable phonetic values of Central Cretan reflexes are given below:

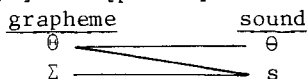
<u>Proto-Greek</u>	*ss	*ts	*t(h)j	*k(h)j	*tw
<u>Central-Cretan</u>					
6-5th c.	?	ts	ts	?	?
5-4th c.	?	tt	tt	tt	?
4-2nd c.	ss	θs	θs	?	tθ

οσσοϛ probably does not represent [ossos], since in Central Cretan the cluster /ts/ (primary or secondary) was subject to the progressive assimilation of sibilant as in Boeotian. *ss* would be a result of the regressive assimilation which is quite common in all other dialects.

In my analysis Central Cretan spellings like οθθakin represent [oθsakin] or [oθθakin] which can be explained phonologically as follows: Primary or secondary /ts/ occurred subject to the complete assimilation of sibilant in 5 - 4th c., and later on in 4 - 2nd c. to the fricativity assimilation, when the dental obstruent was assimilated in manner to the sibilant and became an interdental fricative. Complete assimilation of the sibilant to the preceding interdental fricative could subsequently take place:

	otsos
(Regressive) Fricativity Assimilation	oθsos
(Progressive) Complete Assimilation	oθθos

On the other hand, this interpretation of the spelling does not fit examples like FETETHY or POLITHY (Attic $\epsilon\tau\epsilon\sigma\sigma\upsilon$ or $\rho\acute{o}\lambda\upsilon\sigma\upsilon$), since it is hard to imagine something other than [wetes(s)i] and [polisil].



This is just the opposite of the Laconian pattern:
Laconian before the 5th c.



Laconian after 5th c.



During the 5th C., when the new interdental fricative [θ] developed from pre- or intervocalic /t^h/, the phonetic value [s] represented by the grapheme Σ became closer to the [θ] and could be conveniently used for it. Thus the Laconian gloss βεορ (= βῆθος) can be reconstructed phonetically as [weθoɹ] (or [weθoɹ]).

The Accentual System

4.1 THE GENERAL LIMITING RULE

The Attic accent was in a sense 'free', in other words, its position was not phonologically predictable. However, inside of various inflectional paradigms phonological constraints apply which limit the number of positions in which the accent could occur. The most important of these is a *rule of recession* which limits the distance from the end of the word. This rule is common to all Greek dialects - Ionic, Aeolic and West (Doric) dialects.

As is generally known, the accentuation rules and graphic notations for different types of the accent were elaborated by Aristophanes of Byzantium (about 200 B.C.), in order to teach foreigners the 'correct accent' in pronouncing the Attic Koine. Statements of the Attic *rule of recession* found in various school grammars, based on the work of Aristophanes, are unnecessarily involved and complicated.

Thus Goodwin (1894:24) gives the following account:

The acute can stand only in one of the last three syllables of the word, the circumflex only on one of the last two, and the grave only on the last. The circumflex can stand only on a syllable long by nature. The antepenult, if accented takes the acute. But it can have no accent if the last syllable is long either by nature or by position. An accented penult is circumflexed when it is long by nature while the last syllable is short by nature. Otherwise it takes the acute.

R. Jakobson (1937/1962:263) simplified considerably the rule of recession by introducing the concept of *mora* 'The span between the accented and the final mora cannot exceed one syllable'.¹ The economy of statement achieved by

Jakobson is, however, counterbalanced by the fact that his formulation operates with two distinct notions, which are not easy to define: mora and syllable.

Allen (1966:13) further simplified the rule by getting rid of the syllable, but he introduced the new concept '*contonation*' (= the combination of high pitch + falling glide). Thus he produced the following statement: 'Not more than one mora may follow the contonation'.

A binary accentual opposition in Attic was recognized from the time of Plato (e.g. Cratylus 399 A). A term ὀξύς 'acute' was applied to the positive, culminative feature, occurring only once in each full word (= high pitch). A term βαρύς 'grave' was applied to the negative, non-culminative feature, occurring predictably on all other syllables with the exception of the syllable immediately following the high pitch in the same full word (= low pitch).

The syllable immediately following a high pitch did not bear a low pitch, but a falling glide, starting at a high pitch and finishing low. Since such a glide was automatic in the environment after the high pitch, it must be considered structurally as a contextual variant of the low pitch.

In Attic (and apparently in all other non-Doric dialects i.e. Ionic and Aeolic) when a syllable contained a long vowel or diphthong it could carry a falling melodic pattern without any preceding high pitch. Syllables like that are marked with the circumflex (instead of the acute). It can be said that on the level of phonetics this independent falling glide is identical with the dependent glide following a high pitch.

In Allen's theory, we may consider the falling glide as a feature of the phonetic realization of the accent. The combination of high pitch + falling glide can thus be envisaged as a single unit, which is termed by Allen contonation.

The *phonological opposition* between the falling melodic pattern and the high pitch without falling glide (= between circumflex and acute) existed only in the case of long vowels (or diphthongs) *in final syllables and only in Attic* (and apparently in other Ionic dialects, but *not* in Aeolic). Below are listed some minimal pairs in Attic:

φῶς	'light'	φῶς	'man'
οὔ	'whither'	οὔ	'who'
1) ὅ	'which way,		
	how'		
2) Subj. of ἔημι	'send'	ὅ	'who' (Dat Sg Fem)
εἷς	'one'	εἷς	Aor Part of ἔημι 'send'

λυπηρᾶς	'painful' (Gen Sg)	λυπηράς	(Acc Pl)
θεᾶς	'goddess' (Gen Sg)	θεάς	(Acc Pl)
etc.			

In other words, the alternation of acute and circumflex is in certain cases synchronically unpredictable and acute and circumflex are to be considered as lexical properties of these items. These are not too many and they include grammatical forms. Consequently it might be argued, in terms of more abstract phonology, that the alternation of acute and circumflex on the ultima is predictable as in the case of the alternation on the penult, which is determined by the morphological structure of the word. This would mean that circumflex in φῶς 'light' is predictable, since the underlying representation is **pháos* - all what matters now is if we consider the contraction /a/ + /o/ as a synchronic process. Admittedly, this cannot be ruled out - Attic tragedy knows both φῶς ~ φάος, φωσφόρος 'giving light' ~ φαισφόρος 'light-bringing'.

In Aeolic the variation between acute and circumflex is automatic on the penult (as in Attic) according to the general limiting rule e.g. θῦμος, θύμου (= Attic θυμός). Since in Aeolic the accent of all full words recedes to its full limit, we do not find the change in contour from acute to circumflex on the thematic vowel that is found in Attic e.g. ποτάμος, ποτάμου (= Attic ποταμός, ποταμοῦ) 'river', σόφος, σοφου (= Attic σοφός, σοφοῦ) 'wise'. Thus it can be said with Garde (1968:148), that in Aeolic the mora is irrelevant and only syllables are necessary to accentual description. Consequently, the accent in Aeolic was not contrastive as in Attic. The following Attic pairs, see Vendryes (1938:149 ff), would be homophonous in Aeolic:

a) noun of action	noun of actor or instrument
τόμος 'a cut'	τομός 'cutting'
τρόχος 'a running, course'	τροχός 'a runner, wheel'
b) noun	adjective
ἔχθρα 'hatred'	ἐχθρά 'hated' (Fem)
λευκή 'leprosy; the white poplar'	λευκή 'white' (Fem)
c) concrete noun	abstract noun
ἄρπαγη 'a hook, rake'	ἄρπαγή 'seizure; rapacity;
d) in nominal inflection:	
βόλων (Gen Pl) of βόλος 'a net'	βολῶν (Gen Pl) of βολή 'a throw'
e) proper name	common noun
φαῖδρος	φαιδρός 'bright'

f) in compounding:	passive	active
	πατροκτόνος 'killed by the father'	πατροκτόνος 'parricide'
	θηρότροφος 'feeding on beasts'	θηροτρόφος 'feeding wild beasts'

It is not easy to answer the question whether there was a phonological opposition between the falling melodic pattern and the high pitch (or rather rising melodic pattern) in the case of long vowels (or diphthongs) in penultimate syllables. In the overwhelming majority of examples the occurrence of the circumflex or acute on penultimate long vowels or diphthongs is determined automatically by the length of the final vowel:

δῶρον 'present' vs δώρων (Gen Pl)
παῖδες 'boys' παῖδων (Gen Pl)

Metatony in δῶρον (as contrasted with δώρων) and παῖδες (as contrasted with παῖδων) is found in Attic (and Aeolic) only, it does not exist in Doric (δώρον, παῖδες). This metatony is stated traditionally as a 'final trochee' rule: if the high pitch occurs on a penultimate syllable containing a long vowel or a diphthong it must occur on the first mora if the final vowel is short (i.e. the accent will be circumflex and not acute). If the final vowel is long, then by the general three mora rule the high pitch must occur on the second mora. In other words, there is no phonological opposition of acute and circumflex on penultimate syllables.

However, in Attic there are minimal pairs such as the following:

οἶκος (Nom Pl) 'houses' vs οἶκος (Loc Sg) 'in the house'
λύσσει (Inf Aor) 'loose' λῦσαι (Opt Aor) 'may he loose'

In terms of autonomous phonology the above examples would suffice to prove that there was a phonological opposition between the falling and rising melodic pattern on penultimate syllables in Attic. However, in terms of more abstract phonology the above examples could be explained by grammatical rules which would assign different mora values to the final diphthongs /oi/ and /ai/.

This solution is in perfect agreement with the data of historical phonology. Prepausal diphthongs /oi/ and /ai/ are considered for accentual purposes as monomoric units (i.e. as VC): /oi/ = /oj/ and /ai/ = /aj/. Contrary examples, like the above, contain morphemic boundary in underlying representations: /oi/ = /o + i/ and /ai/ = /a + i/. This entails that the location of the high pitch is specified by the general limiting rule and the alternation between two pitch

contours (falling and rising) is automatic, determined by the fact that the prepausal diphthongs /oi/ and /ai/ count as monomoric or dimoric units.

οἴκοι /oĩkoi /, underlying representation *oĩkoj
οἴκοι /oĩkoi /, *oĩko+i
λυῖσαι /luĩsai /, *luĩsaj
λυῖσαι /luĩsai /, *luĩsa+i

Processual description of Attic is given below:

	οἴκοι	δοῖρον	οἴκο+i	δοῖροον
<i>Metatony</i> (= <i>Final Trochee</i>)	οἶκοι	δόορον	-	-
<i>Loss of</i> <i>morphemic boundary</i>	-	-	οἴκοι	-
	οἴκοι	δῶρον	οἴκοι	δῶρον

The principal objection which might invalidate this analysis (not to mention that the whole approach recapitulates only the historical sequences and hardly represents anything psychologically real) concerns the concept of the mora. Martinet (1954:51) points out that the concept of the mora does not correspond to a phonetic reality, it is only an analytical device occurring in our descriptions (unlike the vowel or syllable). It is unlikely that speakers of Attic were aware of the fact that the prepausal diphthong /oi/ was monomoric in the Nom Pl but dimoric in the Loc Sg. However, they may have been aware of the morphemic boundary in the Loc Sg (this of course is tantamount to saying that they were aware of the fact that the diphthong /oi/ was not a diphthong but a sequence of two vowels /o/ and /i/, something which is counterdicted by the phonetic evidence). Supporting evidence for this statement can, however, be sought in reference to grammatical (morphological) criteria. The meaning of the final /i/ in the Loc Sg could be recovered synchronically on the basis of the following juxtapositions:

οἴκοι /oĩko+i/ 'at home' versus οἴκοθεν /oĩko+then/ 'from home'
χαμαῖ /khama+í/ 'on the earth' χαμαῖθεν /khamâ+then/ 'from the earth'

Some problematic divisions:

ἄλλοθι /álla+thi/ or ἄλλοθεν /álla+t^hen/
/állot^h+i/ 'from elsewhere'

Ἀθήνησι /ath^hēnēs+i/ or
 /Athēnē+si/
 'at Athens'

Ἀθήνηθεν /athēnē-t^hen/
 'from Athens'

There are some difficulties involved in this approach. First of all, there is also a form οἴκοθι /oíko+t^hi/ or /oíko^h+i/ 'at home', with problematic division. Second, οἴκος means not only 'in the house' but also more commonly 'at home'. The phrase 'in the house' would rather be constructed as a prepositional phrase ἐν τῷ οἴκῳ or κατ' οἴκον. Third, synchronically in these examples there is not a postposition -i meaning 'at, on', but -t^hi, cf. many examples like οὐρανόθι 'in heaven', Ἰλίοθι πρό 'before Ilium', etc. Relics of the original locative case in -i are found mostly with toponyms: Ἰσθμοῦ 'at the Isthmus', Πυθοῦ 'at Pytho', etc. These forms can be classified synchronically as adverbs. In other words, the crucial semantic juxtaposition of οἴκος 'houses' and οἴκοι 'at home' yielding the meaning of locative postposition -i is not psychologically very likely; all speakers, however, were aware of the opposition (t^h)i versus t^hen = 'at' versus 'from'.

(1)	πό+i	οἴκο+i	
(2)	πό+t ^h i	οἴκο+t ^h i	ἄλλο+t ^h i
(3)	πό+t ^h en	οἴκο+t ^h en	ἄλλο+t ^h en
(1), (2)	'whither'	'at home'	'elsewhere'
(3)	'whence'	'from home'	'from elsewhere'

Notice also that οἴκος was later used in metaphoric expressions like τὰ οἴκος 'one's domestic affairs', ἡ δ' οἴκος 'one's own country', where the concrete meaning of 'house' disappeared completely. This might be the reason why we find two forms for 'at home': οἴκοι (older) and οἴκοθι (later), where /t^h/ comes probably from /t^hen/ and /i/ is the old locative ending /i/:

(older) oíko + i
 (later) oíko+ t^h + i
 (resegmentation) oíko+ t^h + en

Kiparsky (1967:124) tried to remove some of these difficulties. The most important argument used by him bears on the problem of whether speakers of Attic were aware of the fact that the prepausal diphthong /oi/ was monomoric in the Nom Pl but dimoric in the Loc Sg. Kiparsky's answer is positive and it is based on a 'striking parallelism' between the accentuation pattern of οἴκοι and οἴκοθι. The accent pattern of the locative in -t^hi is given by the rule that the

accent stays in its original place if the stem is disyllabic (as in our case), but shifts to the penultimate mora in stems of more than two syllables e.g. Κόρινθος ~ Κορινθός. But this happens to be identical with the accent pattern of the locative in *-i*, which follows the accent of the stem if it is disyllabic (as in our case) and gets a circumflex on the *-oi* in the case of polysyllables e.g. Μέγαρο ~ Μεγαρόν. These facts suggest to Kiparsky that the above locatives are synchronically related. The way to relate them is the *metathesis rule* which inverts word-final *-i* with preceding dental consonants. By this rule he can derive forms like 2nd Sg Ind λέγεις and 3rd Sg Ind λέγει from Proto-Indo-European **lēgesi* and **lēgeti*. The word-final *-t* or *-th* is deleted by the Greek loss of word final-obstruent stops (as in **sōmat* → σῶμα)

	<i>*legeti</i>	<i>*oikot^hi</i>
<i>Metathesis</i>	<i>legeit</i>	<i>oikoith^h</i>
<i>obstruent stop</i> → ∅ /-#	<i>legei</i>	<i>oikoi</i>

In other words, the derivation of the locative in *-i* from the locative in *-thi* is supposed to account for the shared accent pattern, and also for the accentual peculiarity of the locative in *-i*, namely the dimoric value of the final 'short' diphthong.

I feel somewhat uneasy about this derivation. The left column represents the historical sequence of sound changes from PIE down to Greek; the rules here are simply labels for sound changes which took place in the history of more than a thousand years. The right column represents presumably some synchronic 'mental' process by which speakers of Attic attributed a dimoric value to the final diphthong /oi/. According to this proposal locative like Μεγαρόν is to be derived from underlying **megaróthi* → *megaróth^h* → *megarói*. This proposal does not lack a certain ingenuity, but is completely void of any cogent evidence. Ultimately, Kiparsky refutes himself when he recognizes the double source of the Greek locative - PIE **dhi* would not be the only source of the **-i* locative in Greek, this could be derived also from PIE **-i* with which the **-dhi* locative merged phonologically and thus imposed on it its accentual pattern.

Another difficulty - why there are still locatives in *-thi*, and even side by side with the locative in *-i*, as in οἶκος ~ οἶκοις - is to be obviated by the ambiguous syntactic status of *-thi*, which is interpreted as either a suffix or as an enclitic. Since the suffixes are preceded by morpheme boundaries but enclitics by word boundaries, Kiparsky can derive both οἶκος and οἶκοις from a single underlying **oikothi*:

	<i>*oiko+thi</i>	<i>*oiko#thi</i>
<i>Metathesis</i>	oikoith	-
<i>th - Deletion</i>	oikoi	-

Again there is no cogent reason for undertaking this derivation given the double source of the Greek locative - the underlying form of οἶκος is much more probably **oiko-i*.

Finally it should be mentioned that the parallelism between the accent patterns of οἶκος and οἶκοςθι did not escape the grammarian Herodian, who listed these two side by side in his treatise on Greek accentuation.

This might corroborate the hypothesis that speakers of Attic were really aware of the morphemic boundary in οἶκος on the basis of synchronic juxtaposition of *oiko+i* with *oiko#thi*.

4.2 MINOR RULES AND ENCLISIS OF ACCENT

4.2.1 Minor Rules

There are three other rules, which exist only in the Attic dialect:

- a) The '*Final Trochee*' rule (a misleading label, since the rule refers to vowel lengths, not to syllable quantities): If the high pitch occurs on a penultimate syllable containing a long vowel (or a diphthong), it must occur on the first mora (i.e. the accent will be circumflex and not acute) if the final vowel is short.

This rule did not exist elsewhere. Contrast:

<u>Attic</u>	παῖδες	<u>Doric</u>	παῖδες	'boys'
	γυναῖκες		γυναῖκες	'women'
	τιμῶμεν		τιμῶμες	'we honour'

- b) '*Wheeler's Law*':

Original polysyllabic oxytones become paroxytones if the vowel of the penult is short and the vowel of the antepenult is long (= if the word has a dactylic ending).

This rule did not exist elsewhere. Contrast:

<u>Attic</u>	πατροκτόνος	<u>Aeolic</u>	πατρόκτονος	'parricide'
	ποικίλος		ποῖκιλος	'many-coloured'
	ἄγκυλος		ἄγκυλος	'crooked'

For the original accent of composite words like **πατροκτονός*, see words which do not have a dactylic ending: ἵπποφορβός 'horse-keeper', στρατηγός 'commander'.

The original final accent of trisyllabic adjectives in -υ/-υλος is reconstructed mainly on the basis of

external evidence (Vedic *pesālās*, *aykūrās*).

However, quite a few analogical extensions obliterate the original conditions under which this rule operated, e.g. οἰκοδόμος 'architect', οἰκονόμος 'housekeeper'; see Lejeune (1972:298).

c) 'Vendryes' Law':

A word with properispomenon accent, as ἐρημος 'desert', retracts the accent to the preceding syllable if this is light. Thus we have in Attic ἔρημος against ἀνδρεῖος 'manly' where the first syllable is heavy.

According to Lejeune (1972:298) 'Vendryes' Law' operates also across word boundaries: ἐγὼ#γε → ἔγωγε, ἐμοῖ#γε → ἔμουγε.

It means that in this case 'Vendryes' Law' operates on the output of 'final trochee' rule:

	egō # ge	emoí # ge
<i>Final Trochee</i>	egōge	emoíge
<i>Vendryes' Law</i>	égōge	émoíge

That Greek grammarians refer to an Old Attic τροπαῖον which was later accented (according to 'Vendryes' law') τροπαῖον, seems to indicate that 'Vendryes' Law' could be a synchronic rule of (Old) Attic. Presumably, in terms of relative chronology it was a later phenomenon than the Attic isovocalic and anisovocalic contractions (like φιλέομεν → φιλοῦμεν, φιλέετε → φιλεῖτε). Unfortunately, the chronology of isovocalic contractions is impossible to establish; see Bartoněk (1966:71). If this is so, the problem seems to be why the contracted forms, where the circumflex originates from contraction, do *not* retract their accent according to 'Vendryes' Law'.

Why did speakers of Attic not retract the accent in the case of the circumflex arising from contractions? In other words, how to explain that the rule of accent retraction (= Vendryes' Law) does not apply if it is ordered after the contraction? Schematically:

	erēmos	philéomen
<i>Contraction</i>	-	philōmen
<i>Vendryes' Law</i>	érēmos	-

According to Sommerstein (1973:126) the rule of accent retraction must come *before* the contraction, since if after the contraction the rule would incorrectly generate *φιλούμεν from φιλοῦμεν. It can be pointed out that (for some speakers at least) uncontracted forms were psychologically real in the sense that they occurred in historical orthography

(e.g. Homeric poems). Second, since uncontracted forms occurred in many other dialects it can be said that they existed as 'surface' forms in native dialects of many bidialectal speakers. We can imagine speakers of 'mild' Doric dialects from the Saronic Gulf or speakers of the Boeotian dialect adjusting their dialects to 'standard' Attic Koine. They could not fail to realize the relationship between Attic φιλοῦμεν and their native φιλέομεν, φιλέομες or φιλῶμεν, φιλῶμες (with *height dissimilation* /eo/ → /io/) and consequently could 'analyze' their learnt Attic φιλοῦμεν as φιλέομεν. This might indicate that there is not much point in reordering the above rules, at least so far as we have in mind our main purpose of interdialectal comparisons. Since the 'final trochee' rule is not found in Doric dialects, we may order the contraction before this rule in the derivative schema:

	<u>Attic</u>			<u>Doric</u>
	erēmos	tīmáomen	phīléomen	tīmáomes
<i>Contraction</i>	-	tīmōmen	phīlōmen	tīmōmes
<i>Final Trochee</i>	erēmos	timōmen	philōmen	-
<i>Vendryes' Law</i>	érēmos	-	-	-
<i>Raising</i>	-	-	philōmen	-

What is spurious in this derivation is that the contraction in Attic yields an acute accent, which is changed into a circumflex by the 'final trochee' rule. If we derive the circumflex immediately, we cannot explain why the same is not good for Doric, and furthermore it becomes obvious that there is no point in bringing Vendryes' Law into the discussion. In other words, the question as to why not *φιλούμεν instead of φιλοῦμεν, and the problem of ἔρημος versus φιλοῦμεν, are more or less pseudoproblems. Especially in the latter case we are comparing incomparables in the sense that the 'final trochee' rule deriving érēmos from *erēnos is a historical rule (i.e. the change from *erēnos into érēmos by the final trochee rule and Vendryes' Law is a historical change), while the contraction tīmáomen → timōmen is a synchronic process.

4.2.2 Enclisis of Accent

Full words with enclitics following form a phonological unity which manifests itself in the enclisis of accent of the enclitic. The accent of the full word serves now as the accent of the resulting phonological word. Thus in Attic we

get combinations like ἀνὴρ τις where the accent of the full word ἀνὴρ serves as the only accent of the combination ἀνὴρ τις 'a man'.

Where the accent of the full word, if applied to the resulting phonological word, would be in disagreement with the general limiting rule, a secondary accent is added to make the phonological word comply with this general rule: e.g. underlying ἀνθρωπος becomes ἀνθρωπός τις.

It can be said, that the general rule of recession operates, with notable exceptions, across word boundaries (in contrast with the 'final trochee' rule). The exceptions are:

- a) It is impossible to add a secondary accent in combinations like

καλῶς πως
καλοῦ τινος
καλῶν τινων
οὕτω πως

since the prepausal syllable carries a falling glide.

- b) There is a secondary accent added in combinations like

οὗκοι τινων

but the general limiting rule still does not apply, since there is a long vowel in the final syllable of the enclitic τινων. As is well-known, the same happens in the inflection of words like πόλις 'city', Gen Sg πόλεως, where there is an explanation for this anomaly, namely metathesis of vowel-length $*pólējos \rightarrow pólews$. It is usually said that the length of the final vowel of the enclitic is irrelevant. This seems to be a very likely explanation, which is tantamount to saying that (colloquial) Attic neutralized the contrast of vowel length in the final syllable of enclitics, consequently for the purpose of accentual description καλοῦ τινος and καλῶν τινων behave in the same way: [kalỗ # tinos] and [kalỗn # tinon]. So there is a complete parallel with the accentual pattern of πόλις

(Dat Pl) πόλεσι(ν) - καλοῦ τινος
(Gen Sg) πόλεως - καλῶν τινων

Alternatively, we may hypothesize that the enclisis of accent was governed by the 'three syllable' rule (see under 4.3.2).

On the other hand, the Attic 'final trochee' rule does not apply across word boundaries. Thus the phonological word φῶς τις 'a man' is not turned into φῶς τις (which would be homophonous with φῶς τις 'a light') by this Attic rule. Only when the word boundary is really erased and the full

word and its enclitic constitute a real semantic unit will the 'final trochee' rule apply. This observation has already been made in antiquity - according to Herodian, the combination of τοῦς and enclitic δε, after they merged to form the demonstrative pronoun τοῦσδε, is to be accented τοῦσδε, according to the 'final trochee' rule. The word boundary is equally erased in the combination like ἐγώγε which merges into a single semantic and phonological unit ἔγωγε 'I (at least)'. On the other hand, in the combination τοῦτιδε 'this (at least)' the word boundary has not been erased and the demonstrative pronoun receives its secondary accent. Since the 'final trochee' rule is limited to Attic it might be expedient to compare Attic and (reconstructed) Doric forms:

<u>Attic</u>	egō # ge	anēr # tis	ánthrōpos # tis
<i>Antepenult</i>	-	-	ánthrōpós # tis
<i>Boundary Erasure</i>	egōge	-	-
<i>'Final Trochee'</i>	egōge	-	-
<i>'Vendryes' Law'</i>	égōge	-	-
<u>Doric</u>	egō # ge	anēr # tis	anthrōpos # tis
<i>Boundary Erasure</i>	egōge		

Disyllabic enclitics represent an exception to the general rule that enclitics are unaccented. According to the ancient tradition, there is a secondary accent placed on the final syllable of enclitics. However, there arises a difficulty if we compare forms like

καλοῦ τινος	versus	μεγάλου τινός
καλῶν τινων		μεγάλων τινῶν

One may wonder why the tradition does not show forms like καλοῦ τινός or καλῶν τινῶν. Allen (1973:241) tried to obviate this difficulty by assuming a rule that not more than two unaccented syllables may follow the syllable containing the high pitch; admission of syllabic criteria into a mora-based accentual system is legitimate - syllabic criteria are being admitted into mora-systems in Lithuanian and Serbo-Croatian.

So if the combinations like ἄνθρωπος τις, ἄνθρωποι τινες are accented according to the general limiting rule, the combination like μέγαλου τινές follows the above rule forbidding more than two unaccented syllables after the high pitch. This kind of reasoning may have been based on the observation of actual usage in contourless dialects - we may hypothesize that this was the rule governing the

accentuation of enclitics in 'syllable-counting' Doric dialects. Finally, notice that this rule is actually the 'three-syllable rule', which I will postulate as a pre-historic ancestor of the general limiting rule (under 4.3.2).

<u>Attic</u>	<u>Doric</u>
καλοῦ τινος	καλῶ τινος
μεγάλου τινές	μεγάλου τινές
ἀνθρώπου τινες	ἀνθρώποι τινές

4.3 HISTORICAL ORIGINS OF THE GREEK ACCENT PATTERN

4.3.1 *Vedic and Greek*

As recognized long ago, the Greek and Vedic accentual systems go back to a common Indo-European source. This is obvious for reasons such as the following:

- a) There are numerous correspondences regarding the location of high pitch (Greek ὀξύς 'acute' = Vedic *udātta* 'raised') on the ultima, on the penult (and more rarely even on the antepenult). A long list is given in Schwyzer (1938:380-1).
- b) There are close parallels in the accent pattern of nominal and verbal paradigms, which are best explained by assuming a common origin.

Compare for example movable stems in Vedic and Greek:

	<u>Vedic</u>		<u>Greek</u>
Sg Nom	pāt̃ 'foot'		πούς
Gen	padás		ποδός
Loc	padí	Dat	ποδί
Acc	pādam		πόδα
Sg Nom	pitā́ 'father'		πατήρ
Gen	pitúr		πατρός
Loc	pitári	Dat	πατέρι
Dat	pitré	Dat	πατρί
Acc	pitāram		πατέρα
Voc	pítar		πάτερ

- c) Even more impressive is the fact that both Vedic and Greek accent possess the distinctive properties of PIE 'free' accent. Thus the similar permutations of accent can in both branches distinguish between the lexical meaning of a noun of action and that of an actor (or the grammatical meaning of a noun versus adjective):

Vedic

ápas	'work'	apás	'active'
váras	'choice, wish'	varás	'suitor, lover'
táras	'quickness'	tarás	'quick'
mánas	'mind'	durmanás	'evil-minded'

Greek (Attic)

τόμος	'a cut, slice'	τομός	'cutting, sharp'
τρόχος	'running'	τροχός	'runner, wheel'
ἔχθρα	'hatred'	ἐχθρά	'hatred, hateful' (Fem)
μένος	'mind'	δυσμενής	'evil-minded'

The main difference is that in Vedic there are no phonological constraints (regarding either the number of the preceding or following syllables or moras) which would limit the distance of the accent from the end of the word (contrast the 'recession' rule of Attic verbs and of both nouns and verbs in Lesbian). The accent in Vedic could occur on the 2nd, 3rd, 4th or 5th syllable from the end of the word. The rules of compounding could place the accent on the initial syllable as far as the 7th, 8th or 9th syllable from the end of the word:

Vedic

bhárāmanas
ánapahitas

Greek

φερόμενος 'carried'
ἀνεπιθέτος 'admitting no
addition'

ábubodhiṣāmahī 'we wanted
to learn'
híranyavāśīmattamas 'wielding a
golden axe'

The list of accentual discrepancies regarding the location of the high pitch would be equally long (see again Schwyzler (1938:381)). Quite typical examples are cases where Vedic preserves the original final or penultimate accent, whereas Greek shifts the accent to the antepenult:

Vedic

saptamá 'seventh'
aṣṛíya 'pertaining to field'
katará 'which (of two)?'
anudrá 'waterless'
subhára 'dense, abundant'
paričará 'companion, servant'

Greek

ἑβδομος 'seventh'
ἄγριος 'wild'
πότερος 'which (of two)?'
ἄνυδρος 'waterless'
εὐφορος 'easily borne,
bearing well'
περίπολος 'watchman'

Thematic verbs in PIE could be accented in one of two ways: the accent could be located either on the root or on the thematic vowel. (Athematic verbs had mobile accents throughout the inflection of the Present - on the root in the singular and on the ending in the dual and plural).

In the first case (= Vedic Class I), the accent is located columnarly on the root throughout the inflection of the Present regardless of the number of following syllables. In the Imperfect the accent is retracted to the augment (regardless of the 2, 3 or 4 following syllables).

In the second case (= Vedic Class VI), the accent is located columnarly on the thematic vowel; consequently the number of following syllables does not exceed 2. In the Imperfect again the accent is retracted to the augment (regardless of the 2, 3 or 4 following syllables).

It can be said that the innovation of the Hellenic branch in the case of thematic verbs consists in the redistribution of these two PIE patterns. In Greek the Present Middle is root-accented with the exception of the 1st Pl (which is accented on the thematic vowel)—thus the accent of

3 Sg φέρεται corresponds to *bhárate* (Class I)

but the accent of

1 Pl φερόμεθα corresponds to *viśámāhe* (Class VI).

Likewise the accent of the Imperative

2 Pl φέρετε corresponds to *bhárata* (Class I)

but the accent of

3 Sg φερέτω corresponds to *viśátām* (Class VI)
not *bháratām*, which is root-accented.

THEMATIC VERB

		<u>Vedic</u> (Class I)	<u>Greek</u>		<u>PIE</u>
a)	<u>Present Active</u>				
	Pl 3	bháranti	φέροντι	(Doric)	bhéronti
	1	bhárāmas	φείρομες	(Doric)	bhéromes
b)	<u>Imperfect Active</u>				
	Pl 3	ábharan	ἔφερον	(Attic)	ébheron
	1	ábharāma	ἐφείρομεν		ébheromen
c)	<u>Present Middle</u>				
	Pl 3	bhárante	φέρονται		bhérontei
	1	bhárāmahe	φερόμεθα		bhéromeCV

d) Imperfect Middle

P1	3	ābharanta	ἐφ'έροντο	ébheronto
	1	ābharāmahi	ἐφερόμεθα	ébheromeCV

Vedic (Class VI)a') Present Active

P1	3	viśānti	'enter'
	1	viśāmas	

b') Imperfect Active

P1	3	āviśam
	1	āviśāma

c') Present Middle

P1	3	viśānte
	1	viśāmahe

d') Imperfect Middle

P1	3	āviśanta
	1	āviśāmahi

If we believe that the Vedic columnar accent in the above finite verbal forms continues the PIE accent pattern, these examples would show that Greek moved the PIE accent in the thematic verbal forms from the augment to the root, or elsewhere from the augment or the root to the thematic vowel, so that the high pitch in Proto-Greek was always located on the antepenultimate syllable. We can formalize these data using the following abbreviations:

- R - monosyllabic root
 T - thematic vowel
 s - monosyllabic suffix
 ss - disyllabic suffix
 a - augment

	<u>Proto-Indo-European</u>		<u>Greek</u>
a)	$\begin{array}{c} \acute{R} \ T \ s \\ \acute{R} \ T \ s \end{array}$	a') $\begin{array}{c} R \ \acute{T} \ s \\ R \ \acute{T} \ s \end{array}$	$\begin{array}{c} \acute{R} \ T \ s \\ \acute{R} \ T \ s \end{array}$
b) = b')	$\begin{array}{c} \acute{a} \ R \ s \\ \acute{a} \ R \ T \ s \end{array}$		$\begin{array}{c} \acute{a} \ R \ s \\ a \ \acute{R} \ T \ s \end{array}$
c)	$\begin{array}{c} \acute{R} \ T \ s \\ \acute{R} \ T \ s \ s \end{array}$	c') $\begin{array}{c} R \ \acute{T} \ s \\ R \ \acute{T} \ s \ s \end{array}$	$\begin{array}{c} \acute{R} \ T \ s \\ \acute{R} \ T \ s \ s \end{array}$
d) = d')	$\begin{array}{c} \acute{a} \ R \ T \ s \\ \acute{a} \ R \ T \ s \ s \end{array}$		$\begin{array}{c} a \ \acute{R} \ T \ s \\ a \ \acute{R} \ \acute{T} \ s \ s \end{array}$

Another innovation of Greek is the accent pattern of the Imperfect (if of course Vedic continues the PIE accent pattern). In Proto-Greek the accent pattern of the Imperfect was the same as that of the Present, i.e. it was subject to the same phonological constraint which locates the high pitch on the antepenultimate syllable. On the other hand, in Vedic (and presumably in PIE) the augment was always accented, the augment belonged to a class of 'accentable' morphemes. This statement, of course, needs a further clarification; it seems to be true in many cases, but there are some notable 'exceptions'. First of all, it presupposes the reconstruction of the Proto-Greek thematic paradigm of the Present as follows:

*phérōmi	φέρω
*phéresi	φέρεις
*phéreti	φέρει

with endings like those of the athematic verb:

*dídōmi	δίδωμι	
*dídōsi	δίδωσι	
*dídōti	δίδωτι	<u>West Greek</u>
	δίδωσσι	<u>East Greek</u>

The problem here is that *-mi* in the 1st Pers might be only an innovation of Vedic; there is no direct evidence for this reconstruction in Greek dialects to justify *phérōmi as a Proto-Greek form. Even the reconstruction of the 2nd and 3rd is not universally accepted in traditional books. The reason is that Proto-Greek *phéresi should yield φέρεις, by the 'laws' governing sound changes in Greek ($s \rightarrow h \rightarrow \emptyset$), and Proto-Greek *phéreti should yield φέρεις in East Greek ($t \rightarrow s$ in the environment between vowels) and remain unchanged in West Greek. However, such forms are not to be found. This problem was discussed by Kiparsky (1967:109), who argued quite convincingly for Proto-Greek forms *phéresi and *phéreti by showing that the 'laws' of sound change did not work inside of this particular paradigm, and derived the historical Greek forms by metathesis (see 5.1, p. 188 ff):

*-esi	$\rightarrow$	-eis
*-eti	$\rightarrow$	-eit $\rightarrow$ -ei

A real 'exception' to the above statement that Greek thematic verbal forms show the high pitch on the antepenultimate syllable is represented by forms with long suffixes, where the accent in non-Aeolic dialects occurs always on the penult, in agreement with historical rule of 'recession'. It is not without interest to realize that all these

suffixes (with a single exception) belong to forms of extremely low frequency. These forms are: Imperatives in the 3rd Pers (in both voices and all numbers - Sg, Dual, Pl) and Dual in the 3rd Pers (in both voices) of all historical (augmented) forms. The exception, so far as the frequency count goes, is represented by the 1st Pers Sg in Middle Voice of all historical (augmented) forms, and also Optatives. Here are some examples with corresponding Vedic forms:

<u>Imperfect Act Dual 3rd Pers</u>	ἑφερέτην	ábharatām
" <u>Mid</u> " " "	ἑφερέσθην	ábharetām
<u>Imperative Act Sg 3rd Pers</u>	φερέτω	bháratu
" " <u>Dual</u> " "	?	bháratām
" " <u>Pl</u> " "	φερόντων	bhárantu
" <u>Mid Sg</u> " "	φερέσθω	bhárantām
" " <u>Dual</u> " "	} φερέσθων	bháretām
" " <u>Pl</u> " "		bhárantām
<u>Imperfect Mid Sg 1st Pers</u>	ἑφερόμην	ábhare
<u>Optative</u> " " " "	φερούμην	bháreya
<u>Aorist</u> " " " "	ἔδειξάμην	ádikṣi 'point'
<u>Optative Aorist Mid Sg 1st Pers</u>	δελεξάμην	vídeya 'find' (asigmatic)

The following conclusions may be drawn from this data:

- a) It is obvious that a PIE reconstruction is reasonable in two or three cases only:

<u>Imperfect Active Dual 3rd Pers</u>	*ébheretāN
<u>Imperative Active Plural 3rd Pers</u>	*bhérontu (Proto-Indic)
	*bhéronto (Proto-Greek)

The reconstruction of Proto-Greek is based on the Aeolic (Lesbian) form φέροντον (the final -n is a Greek innovation).

<u>Imperative Active Singular 3rd Pers</u>	*bhéretu (Proto-Indic)
	*bhéreto (Proto-Greek)

On the basis of Vedic *bhárantām* (Imperative Middle Plural 3rd Pers) the PIE **bhérontāN* can be reconstructed. The same PIE form could yield (?) Attic φερόντων (Imperative Active Plural 3rd Pers). However, there is another

explanation, possibly more convincing. Buck (1955:114) proposed that the ending -ντων, with double pluralization, is a blend of -των (formed from the singular -έτω by the addition of -ν) and -ντω (formed after the 'analogy' of 3rd Pl Indicative -ντι). So it can be said that all the above forms, with the exception of ἑφερέτην and Aeolic φέροντον are innovations of the Hellenic branch, without any direct PIE origin. The same is true about the ending -Μην (1st Pers Sg Middle Voice of all historical forms and optatives). Vedic *ābhare* goes back to PIE **ēbherei*.

- b) Aeolic dialects are closer to Proto-Indo-European in the sense that they did not replace the original short suffix in the 3rd Pers Pl Imp (Aeolic φέροντον = Vedic *bhārantu* = PIE **bhērontu/o*) whereas other dialects replaced this short suffix by the long one, e.g. Attic φερόντων (final -ν in Aeolic, as well as in Attic, represents an East (?) Greek innovation; the *n*-less form φερόντω is well documented by Arcadian, Boeotian, Locrian and Doric dialects).

Aeolic (Lesbian) shows the short suffix even in the 3rd Pers Pl Imp of Middle Voice φέρεσθον (versus Attic φερέσθων); however there is no PIE source for this form (the corresponding Vedic form is *bhārantām*).

In discussing monosyllabic versus disyllabic suffixes, and monosyllabic short versus monosyllabic long suffixes, it is quite interesting to see the long monosyllabic suffix of the 3rd Pers Pl Imp (in both voices) being replaced by a disyllabic suffix. This happened in the period of the spread of the Attic-based Koine through the addition of the Aorist suffix -σαν to the singular ending. This process is observable in later inscriptions in various dialects after about 300 B.C. when φερόντων was replaced by φερέτωσαν (more rarely by φερόντωσαν with double pluralization) and φερέσθων was replaced by φερέσθωσαν.

	<u>Vedic</u>	<u>Greek</u>	<u>PIE</u>
c) <u>Imperative</u>			
Dual 2	bhāratam	φέρετον	bhēretoN
3	bhāratām	?	bhēretāN(?)

d) <u>Imperfect</u>			
Dual 2	ábharatam	ἑφέρετον	ébheretoN
	ábharatām	ἑφερέτην	ébheretāN

ῥ = long suffix

c)	<u>Proto-Indo-European</u>	<u>Greek</u>
	Ῐ T s	Ῐ T s
	Ῐ T s	R Ῐ ῥ

d)	á R T s	a R̂ T s
	á R T s̄	a R T̂ s̄

The same shift of the PIE columnar accent to the antepenultimate syllable in Proto-Greek occurred also in nominal thematic paradigms. Again, we presuppose that the accent pattern in the following Vedic words represents the original state of things. It should also be noted that the examples given below of nominal inflection are adjectives, where more regularities are to be expected than in nouns.

	<u>Vedic</u>	<u>Homeric Greek</u>	<u>PIE</u>
c) Sg Nom	úttaras	ύστερος	útteros
Gen	úttarasya	ύτέροιο	útterosjo
c') Sg Nom	aṛíryas	άγριος	agriós
Gen	aṛíryasya	άγριοιο	agriósjo
d) Sg Nom	bháramāṇas	φερόμενος	bhéromenos
Gen	bháramāṇasya	φερομένοιο	bhéromenosjo

We can formalize these data using numbers this time to indicate syllables from the end of the word:

	<u>PIE</u>	<u>Greek</u>
c)	3̂ 2 1	
	4̂ 3 2 1	
c')	3̂ 2̂ 1	(4) 3̂ 2 1
	4̂ 3̂ 2 1	(5) (4) 3̂ 2 1
d)	4̂ 3 2 1	
	5̂ 4 3 2 1	

4.3.2 Three Syllable Rule

If we evaluate all the preceding data we may formulate the prehistoric ancestor to the general limiting rule, which could be labelled the 'three syllable' rule:

The accent (in polysyllabic verbal and nominal forms) is placed on the antepenultimate syllable.

Or we can reword this rule according to Jakobson's formulation of the historical limiting rule:

The span between the accented and the final syllable cannot exceed one syllable.

All that is meant by this rule is that there was a certain stage in the prehistory of Greek dialects when the location of the accent would be describable (with some exceptions) by the 'three syllable' rule not by its historical descendant

(= general limiting rule). There is a fairly general agreement among various textbooks on the historical grammar of Greek as to what this stage looked like. I will give some well-known examples (reconstructed forms are marked with an asterisk; double-asterisked forms are controversial, but essential for my reconstruction of the 'three syllable' rule):

Proto-Greek ancestor of historical Greek dialects

<u>Thematic Declension</u>	Sg Nom	phérómenos pheroménoio *pheroménoei pherómenon	Pl	phérómenoi **pheroménoōn *pheroménosi pherómenons
<u>Thematic Conjugation</u>	Sg 1 2 3	**phérōmi *phéresi *phéreti	Pl	phéromen/s phérete phéronti

Later development (*haplology*, *contraction* and *metathesis*) of these prehistoric forms obliterated the original state of things and the resulting forms are describable by the historical limiting rule. We can imagine the sequence of historical changes from PIE to Greek as shown below:

	<u>Gen Sg</u>	<u>Dat Sg</u>
	phéromen+o+sio	phéromen+o+ei
<i>Three Syllable rule</i>	pheroménoio	pheroménoei
<i>Haplology</i>	-	-
<i>Contraction</i>	pheroménō	pheroménōi
<i>Metathesis</i>	-	-
<i>Raising</i>	pheroménō	-
	<u>Gen Pl</u>	<u>Dat Pl</u>
	phéromen+o+ōn	phéromen+o+si
<i>Three Syllable rule</i>	pheroménoōn	pheroménosi
<i>Haplology</i>	pheroménōn	-
<i>Contraction</i>	-	-
<i>Metathesis</i>	-	pheroménois(i)
<i>Raising</i>	-	-

Doric forms² compared with Attic show the effects of analogical levelling of paradigms:

<u>Attic</u>	<u>Doric</u>	
ἐλάβομεν	ἐλάβομεν	'we took'
ἔλαβον	ἐλάβον	'they took'
φερόμενοι	φερομένοι	'carried' (Masc Pl)
φερομένη	φερομένᾱ	'carried' (Fem Sg)

We may imagine the sequence of historical changes (= metatonies) as follows:

	élabomen	élabon(t)	
<i>Three Syllable rule</i>	elábomen	-	
<i>General Limiting rule</i>	-	-	
<i>Accent Levelling</i>	-	elábon	<u>Doric</u>
	phéromenoi	phéromenā	
<i>Three Syllable rule</i>	pherómenoi	pherómenā	
<i>General Limiting rule</i>	-	pheroménā	<u>Attic</u>
<i>Accent Levelling</i>	pheroménoi	-	<u>Doric</u>

In the case of contracted stems there is no need for the 'three syllable rule', or, rather in this case the 'three syllable rule' is the same as the general limiting rule. This can be demonstrated by the derivational history of the following forms:

	<u>Attic</u>	<u>Doric</u>	
Sg Nom	δοῦλος	δῶλος	'slave'
Gen	δοῦλου	δῶλω	
Pl Nom	παῖδες	παῖδες	'boys'
Gen	παῖδων	παῖδων ³	
	dówelos	dóweloio	
<i>General Limiting rule</i>	-	dowéloio	
$w \rightarrow \emptyset / V - V$	dóelos	doéloio	
<i>Contraction</i>	dóolos	doóloo	<u>Attic</u> /dṓlos/ /dṓlō/
<i>Accent Levelling</i>	doólos	doóloo	<u>Doric</u> /dṓlos/ /dṓlō/
	páwides	páwidoon	
<i>General Limiting rule</i>	-	pawídoon	
$w \rightarrow \emptyset / V - V$	páides	paidoon	<u>Attic</u> /páides/ /paidōn/
<i>Accent Levelling</i>	paídes	paidóon	<u>Doric</u> /paídes/ /paidōn/

Summarizing this discussion, I suggest the following tentative sketch of the historical development of the Greek accent pattern in terms of the sequence of metatonies from PIE:

	<u>Attic-(Ionic)</u> (mora accent)	<u>Aeolic</u> (syllable accent)	<u>Doric</u> (syllable accent)
(1)	three syllable rule	three syllable rule	three syllable rule
(2)	general limiting rule	general limiting rule	general limiting rule
(3)	minor rules		accent levelling ⁴

<u>PIE ancestor of Greek</u>	*élabomen	-	*élabont
	*phéromenoi	-	*phéromenā

prehistoric 'three syllable' rule

<u>Proto-Greek</u>	elábomen	-	élabon
	pherómenoi	-	*pherómenā

general limiting rule

<u>Historical Greek</u>	elábomen	-	élabon	<u>Attic-Ionic</u>	ἐλάβομεν-ἐλαβον
<u>Dialects</u>	pherómenoi	-	pheroména	<u>Aeolic</u>	φερόμενοι-φερομένη

analogical accent levelling

ἐλάβομεν-ἐλάβον	<u>Doric</u>
φερομένοι-φερομένᾱ	

4.3.3 Analogical Accent Levelling

The phenomenon of analogical accent levelling, which presumably was so important in the formation of Doric paradigms, is also well-documented in Attic in both *nominal* and *verbal* inflection of contracted forms. One may contrast the inflection of ἄξιος 'worthy' with the inflection of contracted εὔνους 'well-disposed', and the inflection of Imperfect ἔλυον 'I unbound' with the inflection of contracted ἐφύλουν 'I loved':

		contracted forms	uncontracted forms
Sg Nom	ἄξιος	εὔνους	εὔνοος
Gen	ἀξίου	εὔνου	εὔνδου ⁵
Dat	ἀξίῳ	εὔνῳ	εὔνδῳ ⁵
Acc	ἄξιον	εὔνου	εὔνοον
Sg 1	ἔλυον	ἐφύλουν	ἐφύλεον
2	ἔλυες	ἐφύλεις	ἐφύλεες
3	ἔλυε	ἐφύλει	ἐφύλεε
Pl 1	ἐλύομεν	ἐφύλοῦμεν	ἐφύλεομεν
2	ἐλύετε	ἐφύλεῖτε	ἐφύλέετε
3	ἔλυον	ἐφύλου	ἐφύλεον

The question which arises is why speakers of Attic retracted the accent in εὔνου (from εὔνδου), but did not in ἐφύλεῖτε (from ἐφύλέετε); the form *ἐφύλειτε does not exist.

In other words, if we claim that speakers of Attic could synchronically recover ἐφύλέετε (or that ἐφύλεῖτε was for them underlyingly ἐφύλέετε, see under 4.2.1), we have to explain why they failed to do the same in the case of Gen Sg εὔνου since if they did not the resulting form would be *εὔνοῦ. As demonstrated by Kurylowicz (1945-49) - and more recently by Antilla (1972:88-108) - examples like this

necessitate the introduction of some principle which would be independent of phonology; a principle which is well-known in traditional grammar under the label of analogical levelling and whose effects are usually termed paradigm coherence. Notice that this principle presupposes the notion of 'paradigm' as something psychologically real, the operational locus of analogical levelling.

	<u>Uncon- tracted forms</u>	<u>phono- logically 'proper' forms</u>	<u>analogical levelling</u>
Sg Nom	εὔνοος	εὔνοος	εὔνοος
Gen	εὔνοου	*εὔνοϋ	εὔνου
Dat	εὔνῳ	*εὔνῳ	εὔνῳ
Acc	εὔνοον	εὔνοον	εὔνοον

Given the nature of our documents it is hard to say whether the phonologically 'proper' forms εὔνοϋ and εὔνῳ were actually prevented from occurring or whether they really resulted and were leveled out by analogy with other members of the paradigm (Nom and Acc) and other disyllabic adjectives. The same situation obtains in plural where forms such as Gen *εὔνων and Dat *εὔνοϋς are not found. It may be noted that the actually documented form εὔνων breaches the general limiting rule. Put shortly, εὔνοος behaves like any other disyllabic uncontracted paroxytone in that it keeps the accent columnarly in all forms on the penult (e.g. φίλος 'dear', Gen Sg φίλου).

A more abstract solution could require a reconstruction of the thematic vowel (as in thematic nouns) and both Gen and Dat Sg would then be derived from *εὔνο+οιο and *εὔνο+οει by haplology.

	<u>Sg Nom</u>	<u>Sg Gen</u>	<u>Sg Dat</u>	<u>Sg Acc</u>
<i>Haplology</i>	εὔνοος	εὔνοοιο	εὔνοοει	εὔνοον
<i>Contraction</i>	εὔνῳς	εὔνοῖο	εὔνοῖει	εὔνοῖν
<i>Raising</i>	εὔνῳς	εὔνοῖ	-	εὔνοῖν

It should also be noted that the phonologically 'proper' forms would be homophonous with some forms of the verb εὔνω (<εὔνω) 'send to sleep':

*εὔνῳ	'well-disposed' (Dat Sg)	versus	εὔνω	'I send to sleep'
*εὔνων	" (Gen Pl)		εὔνων (<εὔνωων)	" (Participle)

Thus it could be that the proportional analogy with disyllabic adjectives prevented forms which would be accented

on the ultima from occurring (the accent in disyllabic adjectives remains on the initial syllable even in the Gen Pl Fem):

$$\frac{\text{phílos}}{\text{phílō}} = \frac{\text{eúnōs}}{\text{x}}$$

The case of contract verbs is just the opposite. The application of the limiting rule would cause anomaly in the sense that the accent would be distributed columnarly in all forms of the Imperfect. This would contradict the accent pattern of Attic, which shows a characteristic regressive accent in the Imperfect, Perfect and Aorist Active, where a dissyllabic ending appears. The shift of accent one place to the end characterizes the plural paradigm versus the singular paradigm (1st and 2nd Pers):

	<u>Singular</u>	versus	<u>Plural</u>
1	ἔλουν		ἐλούμεν
2	ἐλυες		ἐλύετε
1	ἐφύλουν		ἐφύλοῦμεν
2	ἐφύλευς		ἐφύλετε

This pattern of course would be blatantly breached by forms (which in a sense are 'proper' phonologically):

*ἐφύλομεν and *ἐφύλειτε. The same was probably true of Doric. Compare the reconstructed Doric paradigms:

2nd Aorist

	<u>Attic</u>	<u>Doric</u>	<u>Hellenistic</u>
Sg 1	ἔλαβον	ἔλαβον	ἔλαβον
2	ἔλαβες	ἔλαβες	ἔλαβες
3	ἔλαβε	ἔλαβε	ἔλαβε
Pl 1	ἐλάβομεν	ἐλάβομεν	ἐλάβομεν
2	ἐλάβετε	ἐλάβετε	ἐλάβετε
3	ἐλάβον	ἐλάβον	ἐλάβοσαν ⁶

Contract Verbs - Imperfect

	<u>Attic</u>	<u>Doric</u>	<u>Hellenistic</u>
Sg 1	ἐφύλουν	ἐφύλουν	ἐφύλουν
2	ἐφύλευς	ἐφύλεις	ἐφύλεις
3	ἐφύλει	ἐφύλεις	ἐφύλει
Pl 1	ἐφύλοῦμεν	ἐφύλλομες	ἐφύλοῦμεν
2	ἐφύλετε	ἐφύλλετε	ἐφύλετε
3	ἐφύλουν	ἐφύλλον	ἐφύλοῦσαν ⁶

As seen from the paradigms, Attic ἔλαβον was ambiguous (it could mean either 'I took' or 'they took'). In Doric dialects the 1st Pers Sg was accented on the antepenult but the 3rd Pers Pl on the penult ἐλάβον 'they took'. The situation

in contract verbs is similar. In Attic verbal inflections the accent always recedes to its full limits but in Doric dialects the accent is typically 'progressive' in the 3rd Pers Pl. It may be noted that both situations are anomalous for different reasons. Attic paradigms are regular phonologically (in that the accent always recedes to its full limits) but irregular morphologically since the plural paradigms have mobile accent. On the other hand, Doric paradigms are regular morphologically in that the accent is immobilized (on the augment in singular and on the root in plural), but irregular phonologically (the accent could still recede one syllable leftwards in the 3rd Pl).

Hellenistic Greek solved anomalies of both Attic and Doric systems by borrowing the ending of the sigmatic Aorist *-san*. The extra-syllable in ἐλάβοσαν made it possible to keep the accent on the root (as in Doric plural paradigms) satisfying in the same time the recessive accent of verbal system (as in Attic).

It is of interest to observe a similar tug of war between phonology and morphology in Modern Greek. In Modern Greek past tenses the augment is lost if unstressed - this happens in the 1st and 2nd Pl but there are two forms in the 3rd Pers:

Sg 1	έγραφα	'I wrote'	Pl	γράφame
2	έγραφas			γράφate
3	έγραfe			έγραφan or γράfame

The phonologically proper 3rd Pl *έγραφan* with its mobile accent (see Attic ἐλάβον) is paradigmatically irregular. This irregularity can be liquidated only by the adoption of an extra-syllable (*e*)γράφan-*e* (as in Hellenistic ἐλάβο-σαν), which allows all plural forms to have accent on the root. The elaboration of the same data in derivational terms results in various difficulties; the starting point is **elabōnt*:

	<u>Attic</u>	<u>Doric</u>
	έlabōnt	έlabōnt
<i>Osthoff's Law</i>	έlabont	-
<i>t</i> → ∅ / - #	έlabon	έlabōn
<i>Metatony</i>	-	elábōn
<i>Shortening</i>	-	elábon

First of all, '*Osthoff's Law*' (= a long vowel is shortened in the environment before a liquid, nasal or glide followed by an obstruent) must be invoked. This will apply in Attic but not in Doric. Second, a shortening of the long vowel in **elábōn* must be assumed. It might seem that there is some

evidence for such a shortening - see the 3rd Pl of Passive Aorist ἐλύθην (Homeric), ἐλύθεν (in dialects) versus Attic ἐλύθησαν - however, these forms can be derived by *Osthoff's Law* and the *loss of final -t* as well:

	<u>Homeric</u>	<u>dialects</u>
	elúthēnt	elúthēnt
<i>Osthoff's Law</i>	-	elúthēnt
$t \rightarrow \emptyset / - \#$	elúthēn	elúthen

If we prefer to get rid of '*Osthoff's Law*', we can start, as Kurylowicz⁷ does, with *élabōn:

	<u>Attic</u>	<u>Doric</u>
	élabōn	élabōn
<i>Metatony</i>	-	elábōn
<i>Shortening</i>	élabon	elábon

However, there is no evidence whatever for such a shortening.

That the processual description can be remote from both synchronic and historical (= metachronic) reality can be demonstrated when it comes to the derivation of forms with the Aorist ending -σαν. Here are some more data:

<u>Attic</u>	<u>Homeric</u>	<u>Doric</u>
ἔλυσαν		ἐλύσαν
ἔφασαν		ἐφάσαν
ἔστησαν	ἔσταν	ἐστάσαν
ἐφιλήθησαν	ἐφιλήθην	ἐφιλάθεν

Note also the derivation of ἔστησαν 'they stood':

	<u>Homeric</u>	<u>Attic</u>	<u>Doric</u>
	éstānt	éstāsānt	éstāsānt
<i>Osthoff's Law</i>	éstant	éstāsant	-
$t \rightarrow \emptyset$	éstan	éstāsan	éstāsān
<i>Metatony</i>		-	estāsān
<i>Shortening</i>		-	estāsan
<i>Fronting</i>		éstāsan	-
<i>Raising</i>		estēsan	

As shown by Homeric ἔσταν, the ending -σαν was adopted later on (note however Homeric ἔσαν, Attic ἦσαν 'they were' versus West Greek ἦν). In other words, the processual description above is clearly fallacious since it only repeats the history of Aorist ending -σαν (<*sānt). Synchronically, however, -σαν was adopted as a new unanalyzed marker of the 3rd Pl of historical tenses. What is most remarkable

is the fact that this adoption took place several times in the history of Greek, in preclassical times and Hellenistic times, and as we have seen, a similar adoption of an extra syllable in the 3rd Pl is known also in Modern Greek.

West Greek ἦ+ν
Attic-Ionic ῆ+σαν

Attic ἔλαβον
Hellenistic ἐλάβον+σαν

Here the reason for the adoption of the new ending -σαν seems to be pretty obvious. The Homeric form ἔσταν 'they stood' was quite inconvenient since if used without the augment it was homonymous with the Neuter Participle στάν (Masc στάς). The same is true about West Greek ἦν 'they were' which would be homonymous with 'I was' and 'he was' in Attic.

Thus it might be argued that the processual description given below is more adequate in that it corresponds more closely to what really happened in the history of Greek:

	<u>Attic</u>	<u>Doric</u>
<i>Osthoff's Law</i>	éstānt+san	éstānt+san
<i>t</i> → ∅	éstantsan	éstantsan
<i>n</i> → ∅	éstansan	éstansan
<i>+ Compensatory Lengthening</i>	éstāsan	éstāsan
<i>Metatony</i>	-	estāsan
<i>Fronting</i>	éstāsan	-
<i>Raising</i>	éstēsan	

Notice that in this derivational schema the metatony in Doric is not due to the operation of the general limiting rule, but it is simply a result of the analogical levelling with other members of the plural paradigm (ἐστάσαμεν, ἐστάσατε).

4.4 CIRCUMFLEX IN FINAL SYLLABLES OF THEMATIC NOUNS

Many linguists would agree that the circumflex on the penult results from prehistoric contractions. On the other hand, there is a considerable disagreement in older literature regarding the origin of the circumflex in final syllables. The classical theory, found in Schwyzler (1939:382), goes back to Brugmann and Hirt and is a back-projection of the Greek or Lithuanian situation to Proto-Indoeuropean - the difference between acute and circumflex existed already in the proto-language, subsequently it was lost everywhere with the exception of Greek and Balto-Slavic branches.

As was known long ago, there are correspondences in accent contours in final syllables between Greek (Attic) and Lithuanian. However, the phonetic values of the 'acute' and 'circumflex' are exactly reversed:

	'acute'	'circumflex'
Attic	rising	falling
Lithuanian	falling	rising

Note the following data:

	<u>Lithuanian</u>	<u>Attic</u>
Sg Nom	mergá /-á/	τῤῡή /-eé/
Gen	mergõs /-oós/	τῤῡῆς /-ées/
Pl Gen	mergũ /-uũ/	τῤῡῶν /-óon/
Acc	mergàs /-ás/	τῤῡᾶς /-aás/

In the older literature there was considerable disagreement as to which represents the more original state of things: the Lithuanian or the Attic pattern. Proponents of the distinction acute ~ circumflex in the final syllable in Proto-Indo-European alternatively explained both branches from PIE by assuming that either Lithuanian or Greek underwent a sound change (= metatony), which reversed the original accent contour in final syllables.

Kurylowicz (1958) demonstrated that such an assumption is wholly unnecessary, since both Greek and Balto-Slavic accent contours are of secondary origin, and he views the original Proto-Indo-European system as a Vedic-like system without any distinctive oppositions of contour.

According to Kiparsky (1973:830) the correspondence of Greek falling to Lithuanian rising accent is not due to any metatony, but to the shift from central to marginal mobility. He demonstrates it in the moraic analysis of Lithuanian, where his starting point is a system like that of Attic with the IE rules producing contour accents.⁸

However, it is quite obvious that the circumflex accent in the final syllable of σ -stems is a Greek innovation resulting from early contraction processes (as in the case of contractions taking place inside the word), which are distinct from the later Greek contractions. Compare the following Greek and Sanskrit forms with hypothetical reconstructions of Proto-Greek:

	<u>Greek (Attic)</u>		<u>Proto-Greek</u>	<u>Vedic</u>
Sg Nom	τῤῡή	contraction	tīmā	kanyā 'girl'
Gen	τῤῡῆς	←	tīmājēs	kanyāyās
Dat	τῤῡῇ	←	tīmājei	kanyāyai
Acc	τῤῡήν		tīmān	kanyām
Pl Nom	τῤῡαί			kanyās
Gen	τῤῡῶν	←	tīmāōn	kanyānām
Dat	τῤῡῶσι	(Early Attic)	tīmāsi	kanyāsu (Loc)
Acc	τῤῡᾶς		tīmāns	kanyās

The traditional assumption that the circumflex in Greek inflections originates from prehistoric contractions is undeniably correct. As the Vedic evidence indicates, the Proto-Greek ancestor of the Attic inflections with circumflex was always disyllabic: **āes* → *ās*, **āei* → *āi*; thus the resulting circumflex is the only possible accent. While the contractions in Gen and Dat Sg are prehistoric (i.e. the disyllabic forms of endings are prehistoric forms, which are not synchronically recoverable), the contraction of the disyllabic form in the Gen Pl Fem was a contemporary process in many of the Greek dialects.⁹

It is most unfortunate that we do not know enough about the accentuation of thematic inflections in other dialects. If on the basis of what we know about the accent pattern of Lesbian and Doric we undertake the reconstruction of the paradigm in these two dialectal groups, we might hypothesize that the split in contour accent between the strong and weak cases (Nom, Acc versus Gen, Dat) existed only in Ionic dialects:¹⁰

	<u>Ionic</u>		<u>Aeolic</u>		<u>Doric</u>	
Sg Nom	τεή	τῆμή	τεῆ	τῆμη	τεᾶ	τῆμᾶ
Acc	τεήν	τῆμήν	τεῆν	τῆμην	τεᾶν	τῆμᾶν
Gen	τεῆς	τῆμῆς	τεῆς	τῆμης	τεᾶ	τῆμᾶς
Dat	τεῆι	τῆμῇ	τεῆι	τῆμῃ	τεᾶι	τῆμᾶι

It is worth mentioning in this connection that even Attic had paradigms which do not show the split in contour accent - these are paradigms of contract nouns like *μνᾶ* 'mina', *σῦκῆ* 'fig-tree':

	<u>Attic</u>		<u>uncontracted</u>
Sg Nom	μνᾶ	σῦκῆ	σῦκέα
Acc	μνᾶν	σῦκῆν	σῦκέαν
Gen	μνᾶς	σῦκῆς	σῦκέας
Dat	μνᾶι	σῦκῇ	σῦκέαι

Other dialects have uncontracted forms:

<u>Ionic</u>	μνέα, σῦκέη
<u>Doric</u>	σῦκῶ (with height dissimilation <i>eā</i> → <i>iā</i>).

On the basis of dialectal evidence we may assume that contractions responsible for the circumflex in Attic contract nouns (and adjectives) took place in historical times.

Thus the thematic oxytones with their accent pattern resulting from the prehistoric contractions were synchronically anomalous. This is manifest in the following survey:

Sg Nom	βασίλεια	σφαῖρα	χώρα	συκῆ	θεᾷ
Acc	βασίλειαν	σφαῖραν	χώραν	συκῆν	θεᾶν
Gen	βασιλείας	σφαίρας	χώρας	συκῆς	θεᾶς
Dat	βασιλείᾳ	σφαίρᾳ	χωρᾷ	συκῇ	θεᾷ

a) Thematic proparoxytones (βασίλεια) and properispomenons (σφαῖρα) show the *rightward* shift of accent in weak cases according to the general limiting rule. b) Paroxytones (χώρα) and perispomenons (σῦκῆ) keep the accent distributed *columnarly* in both strong and weak cases. However, c) oxytones (θεᾷ) show the *leftward* shift of accent in weak cases:¹¹

						<u>accent shift</u>
a) Strong cases	ῒ	22	1	ῒ2	1	
Weak cases	3	2ῒ	1	2ῒ	11	rightward
b) Strong cases				2ῒ	11	(22) 11
Weak cases				2ῒ	11	(22) 11 ∅
c) Strong cases						(22) 11
Weak cases						(22) 11 leftward

How realistic is the assumption that the description in (b) and (c) corresponds to what was really heard in colloquial Attic? Did speakers really have the contrast between the acute in θεᾷ and the circumflex in θεᾶς if they did not in the same environment in σῦκῆ/σῦκῆς?

We know from the living tone-accent languages that contour contrasts on the ultima are extremely rare. They do not exist in Serbo-Croatian i.e. Štokavian (see under 4.6); in Lithuanian, there are minimal pairs involving rare grammatical contrasts such as Dat vs. Instr Dual (e.g. *galvóm* vs. *galvõm*), which are limited to the literary language.

Obviously, the contrast between the acute and circumflex on the ultima is possible only in a phrase, since the realization of the rising tone requires a disyllabic sequence; for instance, in connection with enclitics we see the following:

θεᾶς	τινας	/tʰeās + tinas/	'some goddesses' (Acc Pl) vs.
θεᾶς	τινος	/tʰeās + tinos/	'of a goddess' (Gen Sg)
θεᾷ	τις	/tʰeā + tis/	'a goddess' (Nom Sg) vs.
θεῇ	τινι	/tʰeā + tini/	'to a goddess' (Dat Sg)

Similar examples indicate that speakers of Attic may have relied on the contrast between rising and falling pitch even on the ultima of polysyllabic words at phrase level. The tonal criteria could, of course, be easily overridden by segmental contrasts in other syntactic collocations, e.g. with the definite article:

ἡ θεᾷ	/hē + t ^h ēā/	'the goddess' vs.
τῇ θεᾷ	/tē + t ^h ēā/	'to the goddess'
ταῖς θεᾷς	/tās + t ^h ēās/	'the goddesses' vs.
τῇς θεᾷς	/tēs + t ^h ēās/	'of the goddess'

It may be noted that in certain Doric dialects (e.g. Laconian, Heracleian), which simplified the cluster *-ns* in the Acc Pl and lengthened the preceding vowel (see under 2.5.2), the latter pair would be homophonous even with the article, e.g. Laconian ταῖς θεᾷς (Acc Pl = Gen Sg).

It is tempting to hypothesize that for many speakers of colloquial Attic similar forms could be homophonous. Of course, it is beyond the capacity of historical linguistics to say something more specific about local prosodic systems within other dialects and even more difficult to indicate when the contour contrasts on the ultima ceased to represent something psychologically real. (This problem has to be discussed in connection with the overall disintegration of the tone-accent typology of Ancient Greek, which could have taken place earlier than the end of the Graeco-Roman period, see Bubeník (1979)). The resulting homophony of certain grammatical forms was no problem (certainly not in 'strict' Doric dialects and Lesbian) since the grammatical contrasts were always indicated by syntactic collocations. Furthermore, such grammatical homophones actually occurred elsewhere in the Attic nominal system of contract nouns μνᾶς 'mina' Gen Sg = Acc Pl; ἁπλοῦς 'simple' Nom Sg = Acc Pl.

The issue centres around the problem of synchronic recoverability of underlying disyllabic forms, which could justify the circumflex. Whereas in the case of contract nouns (συνῆς < συνέας) or adjectives (χρῆσῆς < χρῆσέας) the disyllabic forms were synchronically recoverable (at least in the sense that here the contractions were recent, or that many dialects did not carry them out), the circumflex in the inflections of thematic feminines had to be learnt separately by each new generation as a new linguistic symbol - here the circumflex was 'underlying'. In any case, the contractions in the Gen and Dat Sg of the 1st Declension were older than 13/14th c. B.C. (Mycenaean evidence in Vilborg (1960:65)). What is of particular interest is the fact that we have to reckon with contemporary contractions in the Gen Pl of the same declension (ψυχᾶων < ψυχῶν). The Dat ψυχᾶς could have resulted from the early Attic *-āsi* → *-ais* by metathesis (see under 5.1).

Thus we may conclude that it was not impossible for contours to function contrastively on the ultima at the

sentence level (oxytones pronounced in isolation would, of course, sound identical with perispomenons). Since typological parallels from living tone-accent languages indicate that this contrast is extremely rare, the question still remains: When Alexandrian grammarians introduced the acute in strong cases and the circumflex in weak cases did they really 'hear' the difference in the contour? And if they did, was the contrast fairly common or found only in the speech of grammarians who knew how to read Homeric poems correctly? There is still one more possibility: namely, that these marks could have been introduced on the basis of analogy of the masculine oxytones of the 2nd Declension, where the acute in strong cases was the only possible accent.

That it is perfectly possible for a feminine form to have the accent of its masculine counterpart by analogy is clearly shown by adjectives:

	<u>Masculine</u>		<u>Feminine</u>
Sg Nom	δύκαλος		δυναία
Gen	δυναίου		δυναίας
Pl Nom	δύκαλοι	————→	δύναιαι
Gen	δυναίων	————→	δυναίων

While the masculine forms show a regular rightward shift of accent according to the general limiting rule, in the feminine instead of expected *δυναῖαι we find the analogical form δύναιαι, and instead of expected *δυναίων we find δυναίων with the accent of the masculine counterparts.

The same analogical extension is found in adjectives which are accented on the long penult like δῆλος 'visible'. In the Gen Pl Fem the accent is not the expected *δηλῶν but rather δῆλων, which again is the accent of the masculine. In other words, these forms show the very same leftward shift of accent as θεᾶ. If the operation of analogy in the accentuation of θεᾶ might seem hard to believe, there are very good reasons for analogical extensions in the accentuation of feminine adjectives:

	expected forms	cf.	actual forms
Nom Sg	δυναῖᾱ	χώρα	δυναῖᾱ
Nom Pl	*δυναῖαι	χωραι	δύναιαι
Gen Pl	*δυναίων	χωρῶν	δυναίων

Adjectival forms predicted on the basis of the nominal forms would include *δυναῖαι (Nom Pl) and *δυναίων (Gen Pl). Instead of this three-way distribution of high pitch we find the accent fixed on the penult with the exceptional shift

leftwards in the Nom Pl. This is a typical accent pattern of the feminine adjectives, which is without parallel in the nominal inflection. This may be shown in the following survey of the distribution of the accent in feminine nouns and adjectives:

		<u>Location of accent</u>	<u>Contour</u>	
NOUN (FEMININE)	βασίλεια	antepenult	acute	Sg N,A; Pl N
		penult	acute	Sg G,D; Pl A,D
	σφαῖρα	penult	acute	Sg G,D; Pl A,D
		ultima	circumflex	Pl G
	χώρα	penult	circumflex	Pl N
		penult	acute	Sg N,A,G,D; Pl A,D
		ultima	circumflex	Pl G
	θεᾷ	ultima	circumflex	Sg G,D; Pl G,D
	καλή	ultima	acute	Sg N,A; Pl N,A
	δουαῖα	antepenult	acute	Pl N
ADJECTIVE (FEMININE)		penult	acute	Sg N,A,G,D; Pl A,G,D
	δύκαιος	antepenult	acute	Sg N,A; Pl N
NOUN	ἄνθρωπος	penult	acute	Sg G,D; Pl A,G,D

As this survey shows, there are two possible sources of the analogical extension of the antepenult accentuation in the feminine plural forms: the masculine adjectival counterpart (δύκαιου → δύκαιαι) or feminine nominal pattern (βασίλειαι → δύκαιαι). We may favour the first source since the Gen Pl Fem δουαῖων is definitely adopted from the masculine paradigm.

Actually, it may be argued that the analogical extension took place only in the Gen Pl since historically the leftward shift of accent in both Masc and Fem Nom Pl may be described by Vendryes' Law (see under 4.2.1): Old Attic *δουαῖου → Classical Attic δύκαιου. The Doric form δουαῖου preserves the original location of accent.

Kurylowicz's theory (1958 and 1968) regarding the origins of the circumflex in the final syllables of thematic nouns is based on the assumption that the regular accent on a long vowel or diphthong is an acute, while the circumflex appeared as a result of analogy with the circumflex that developed in other declensions. In his 1958 theory the analogical source is the contracted paradigm of *s*-stems, e.g. *dusmenēs* 'evil-minded' - where the -s- was aspirated intervocalically, -h- was lost, and the preceding -e- underwent contraction with the vowel of the ending - the resulting circumflex was analogically transferred to the *ā*- and *o*-stems. The table demonstrates these analogical extensions:

		<u>s-stems</u>		<u>o-stems</u>	<u>ā-stems</u>
		uncontracted	contracted (after s→h/∅/V-V)		
Sg Nom		dusmenēs	dusmenēs	agrós	t ^h eã
Acc		dusmenésa	dusmenē̃	agrón	t ^h eãn
Gen		dusmenésos	dusmenō̃s →	agrō̃	t ^h eãs
Dat		dusmenési	dusmenēi →	agrōi	t ^h eãi
Pl Nom		dusmenéses	dusmenē̃is	agroí	t ^h eãí
Acc		dusmenésens	dusmenē̃is	agrōs	t ^h eãs
Gen		dusmenésōn	dusmenō̃n →	agrōn	t ^h eãn
Dat		dusmenéssi	dusmenési	agrōis	t ^h eãis
Dual N/A		dusmenése	dusmenēi	agrō̃	t ^h eã
G/D		dusmenésōin	dusmenō̃in →	agrōin	t ^h eãin

As this table shows, only half of the forms (those connected with arrows) can be accounted for in a such way. Consequently, Kurylowicz is forced to assume various constraints on analogical process, which are sometimes hard to believe. Thus Acc Sg Fem should be *t^heãn* (cf. *dusmenē̃*) but the final nasal is supposed to block the analogy. This assumption is totally unnecessary, since the acute in *t^heãn* is actually analogical with the acute in Acc Sg Masc *agrón*, where the acute in the final syllable is the only possible accent. On the other hand, Acc Pl Fem cannot be explained in such a way; according to Kurylowicz's analogy with s-stems, the Acc Pl of both genders should have circumflex in the final syllable (cf. *dusmenē̃is*) - this time the operation of analogy is supposed to be blocked by the vowel differences. The Nom/Acc Dual did not develop an analogical circumflex because the dual is rather a derivational category.

Kiparsky's theory (1973:794 ff) regarding the origins of the circumflex accent in the final syllables of thematic nouns in Greek is based on the hypothesis that thematic and athematic nouns (belonging to the group of basically unaccented words) are accented by exactly the same rules, even if they receive superficially different accent patterns. These rules are:

- 1) Strong cases have presuffixal accent
- 2) Weak cases have post-stem accent

The derivations of ποῶα (Acc Sg), ποδός (Gen Sg) 'foot' and φυγῆν (Acc Sg), φυγῆς (Gen Sg) 'flight' according to Kiparsky are given below:

	pod + a	phug + ee + n	pod + os	phug + ee + s
1	pód + a	phug + eé + n		
2			pod + ós	phug + ée + s

In athematic nouns, the alternation between presuffixal and post-stem accent produces a shift in the location of the accent from the stem to the ending, while in the thematic nouns the thematic vowel 'intercepts' both the pre-suffixal and the post-stem accent (i.e. the accent does not move but merely changes its contour from acute to circumflex).

Basically two objections can be raised against this proposal. First of all, the statement that theme-accented stems are related to movable athematic nouns is *true only for a part of the Greek dialectal world*, namely the Attic-Ionic dialect, whereas this statement is a misrepresentation in Aeolic and Doric dialects. There are no theme-accented stems (oxytones) in Aeolic and oxytones in Doric do not show the change in contour from acute to circumflex - consequently there can be no relationship between theme-accented stems and movable athematic stems in Aeolic or Doric dialects. In addition, there are in fact no movable athematic stems in Aeolic (admittedly, this is only a hypothesis based on what we know about the accentuation of the Lesbian dialect).¹² Compare the following data:

	Acc Sg	Gen Sg	Acc Sg	Gen Sg
Attic-Ionic	πόδα	ποδός	φυγῆν	φυγῆς
Aeolic	πόδα	ποδοος	φύγην	φύγης
Doric	πόδα	ποδός	φυγάν	φυγός
Attic-Ionic	CVCV	CVCVC	CVCVVC	CVCVVC
Aeolic		CVCV(V)(C)		
Doric	CVCV		CVCVC	

The second point is that only mora analysis can show that the change in contour from acute to circumflex ($V\acute{V} \rightarrow \acute{V}V$) is a movement of accent. However, as rightly pointed out by Martinet (1954:51), the syllable corresponds to a phonetic reality whereas the same is not true for the mora, which is a purely analytic descriptive device. In other words, if a shift in the location of the accent from the stem to the ending in πόδα-ποδός represents a psychologically real process, the change from acute to circumflex does not necessarily entail the breaking down of long vowels into psychologically real components: moras. Consequently, even in Attic-Ionic there is no relationship between theme-accented stems and movable thematic stems, at least in that sense, that these two phenomena are not comparable on the same level.

The whole issue centres around the problem of how speakers of Attic interpreted synchronically the strong/weak accentual pattern $\pi\acute{o}\delta\alpha \sim \pi\acute{o}\delta\acute{o}\varsigma$ which represented an archaic survival from PIE. There could be two ways (at least):

- i) According to Kiparsky they could realize that the accentual relationship between the mobile athematic nouns and thematic oxytones is reversed:

strong case	$\pi\acute{o}\delta\alpha$	$\theta\epsilon\acute{\alpha}$
weak case	$\pi\acute{o}\delta\acute{o}\varsigma$	$\theta\epsilon\alpha\acute{\varsigma}$

- ii) They could relate the rightward accent shift in the mobile athematic nouns to that of all other thematic nouns (with the exception of the contract nouns), as shown above:

strong case	$\pi\acute{o}\delta\alpha$	—	$\beta\alpha\sigma\acute{\iota}\lambda\epsilon\iota\alpha$, $\acute{\alpha}\nu\theta\rho\omega\pi\omicron\varsigma$
weak case	$\pi\acute{o}\delta\acute{o}\varsigma$	—	$\beta\alpha\sigma\iota\lambda\epsilon\acute{\iota}\alpha\varsigma$, $\acute{\alpha}\nu\theta\rho\acute{\omega}\pi\omicron\upsilon$

The first hypothesis depends mainly on the psychological reality of tonal contrasts on the ultima; the latter hypothesis depends on the likelihood of the relatability of the penult-ultima allomorphy found in the athematic nouns and the antepenult-penult allomorphy of the thematic nouns. It may be noted, however, that the thematic nouns behave 'normally', i.e. they are accented according to the general limiting rule, whereas athematic monosyllables are highly marked in that the accent could still move one syllable leftwards in weak cases. Obviously, both hypotheses are highly speculative and aim ultimately at deriving accented forms from underlying unaccented ones. Let us emphasize again that only speakers with the contrast acute-circumflex on the ultima would be able to relate this pattern to that of either mobile athematic nouns or other thematic nouns. It also means that when the tonal system of Ancient Greek started changing its typology toward a stress-accent system the relatability was automatically out of question. We do not know when this happened in the Attic-based Hellenistic Koine, but the fact is that this problem was never faced by the speakers of Doric and Aeolic dialects. Finally, I think it is needless to say that even if we manage to derive $\pi\acute{o}\delta\alpha \sim \pi\acute{o}\delta\acute{o}\varsigma$ and $\phi\upsilon\gamma\acute{\eta}\nu \sim \phi\upsilon\gamma\acute{\eta}\varsigma$ by the same rule for a certain group of speakers we still do not explain the phenomenon of the shift of accent in athematic nouns.¹³

4.5 FUNCTION OF ACCENT IN ANCIENT GREEK DIALECTS

If the accent constantly occurs at a certain point in the word, it fulfills a demarcative function. It was especially

in Aeolic (Lesbian) that this function was clearly pronounced, since the location of the accent in all full words was invariably fixed by the general limiting rule, i.e. the high pitch always receded to its full limit.¹⁴ (Among living languages the Lesbian accent pattern is reminiscent of that found in certain Madeconian dialects which stress automatically the antepenult, e.g. *vodénica* 'mill' - *vodenícata* 'the mill').

This becomes more obvious if we compare the situation in Attic, where the accent also fulfilled a demarcative function by virtue of the same rule but only in the verbal system; nominal and quasi-nominal forms have to be described as underlyingly accented. Among quasi-nominal forms the most notable cases are the following: the Verbal Adjective in *-tós* (ἀγαπητός 'loveable'), the Perfect Participle Middle in *-ménos*, and the Participle and the Infinitive of the 2nd Aorist (λιπών, λιπεῖν 'leave'). It can be said that in these cases one of the functions of the accent was to indicate the morphological structure of these words. Attic dialect by using accent 'freely' could maximize its morphological contrasts whereas Aeolic had to rely only on segmental contrasts.

Attic nouns have to be classified as underlyingly accented on the ultima, penult or antepenult, e.g. σοφός 'wise', ποταμός 'river', φίλος 'friend', ἄνθρωπος 'man'. All these form belong to a set of nominatives of the 2nd Declension but they are accented differently. We may say that the accent is a lexical property of these nouns, which means that each generation of speakers had to learn the accent separately. A look at the words in Aeolic σόφος, πόταμος, φίλος, ἄνθρωπος reveals that here the accent is describable automatically by the general limiting rule. As expressed neatly by Garde (1968:148) 'in Lesbian the law of limitation becomes the law of fixation'. (Generativists would say that Lesbian accent is completely unmarked in the lexicon, whereas in Attic the accent has to be marked for nouns and quasi-nominals).

Consequently it may be said with Garde (1968:148) that the concept of 'mora' is irrelevant in Aeolic, since only syllables are essential to accentual description. From the viewpoint of the demarcative function of accent, cases such as 'accentable' monosyllabic suffixes or polysyllabic oxytones or paroxytones (with the short final syllable) are non-existent in Aeolic. In all polysyllabic words the location of the accent is simply predictable on the antepenult (if the last syllable is short) and on the penult (if the last syllable is long). Thus the alternation between acute and circumflex is predictable in all cases (in contrast with

Attic which has minimal pairs between the falling melodic pattern and the high pitch without fall on final syllables).

On the other hand, this fact eliminates the possibility of a distinctive function of the accent in Aeolic. This can be demonstrated easily if we examine the pairs assembled by Vendryes (see under 4.1). Only the left column (with both meanings) is possible in Aeolic:

πατροκτόνος	'killed by the father' or 'parricide'
θηρότροφος	'feeding on beasts' or 'feeding wild beasts'

Unfortunately, we know much less about the accent pattern of numerous West Greek dialects. Undoubtedly, the number of local prosodic systems in 'mild', 'middle' and 'strict' Doric dialects could be high. As seen above, the reconstructed Doric paradigms show the accent distributed columnarly as a result of the process of analogical accent levelling. The permutations of accent familiar from the inflectional paradigms of Attic were severely limited - at least in the 'strict' Doric dialects (Laconian). It is unfortunate that we do not know anything about the accent pattern of the 'mild' Doric dialects belonging to the Saronic group (Corinthian, Megarian and East Argolic), which were situated midway between Attic and Laconian. In the 'strict' Doric the resulting paradigmatic immobility of accent did not allow for the maximization of morphological contrasts as in Attic. ('Strict' Doric accent pattern is thus reminiscent of the 'logical' accent of the Germanic languages, which never shift the accent in the inflection as Romance or Slavic languages do).

We may compare some Laconian nominal and verbal forms with their Attic counterparts:

	<u>Laconian</u>		<u>Attic</u>
i) Pl 1	ἐλέγομες	'we called'	ἐλέγομεν
2	ἐλέγετε		ἐλέγετε
3	ἐλέγον		ἔλεγον
ii) Pl Nom	ἄγγελοι	'messengers'	ἄγγελου
Gen	ἄγγέλων		ἄγγέλων
Dat	ἄγγέλους		ἄγγέλους
Acc	ἄγγέλως		ἄγγέλους
iii) Positive	γεραιός	'older'	γεραιός
Comparative	γεραιτέρος		γεραιτέρος
iv) Participle Middle:			
Present, Aorist	-νμένος		-νμένος
Perfect	-νμένος		-νμένος
v) Participle Active Present:			
Sg Gen	φερώης		φερούσης
Pl Nom	φερώηαι		φέρουσαι

4.6 TYPOLOGY OF ACCENT IN ANCIENT GREEK DIALECTS

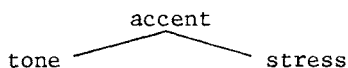
According to Martinet (1954:22) there are three types of languages with respect to the utilization of frequency modulation:

- 1) Tone but no accent (Chinese)
- 2) Accent but no tone (English, Czech)
- 3) Accent and tone in the accented syllable (Serbo-Croatian, Attic-Ionic)

It is well-known that in languages which do not use the lexical accent, like Chinese, virtually all syllables are intoned, whereas in *tone-accent languages only accented syllables are intoned*.¹⁵ As suggested by Garde (1968:142), the neutralization of tonal oppositions in unaccented syllables of these languages is similar to the neutralization of certain vocalic oppositions in unaccented position, e.g. degree of opening in Russian.

Also, it is generally known that it is possible to eliminate the tonal opposition from the description of the lexical accent in tone-accent languages if the moraic analysis is adopted. The long vowel or diphthong, which carries the opposition, in this approach will be analyzed as comprising two morae; there will be no opposition between two different pitch accents. With acute the high pitch will be located on the second mora /oó/ = /ô/ , and with circumflex the high pitch will be located on the first mora /óo/ = /ô/.

Since Doric dialects do not show two different locations of the pitch accent in the same syllable (= there is no opposition between two different pitch contours), Doric can be classified as belonging to the stress-accent type. Since Attic is a tone-accent dialect, we find Ancient Greek dialects internally differentiated in the same way as Modern Slavic or Baltic languages:



Attic	Doric	<u>Ancient Greek Dialects</u>
Serbo-Croatian	Macedonian	<u>Modern Slavic Languages</u>
Lithuanian	Latvian	<u>Modern Baltic Languages</u>

Aeolic (Lesbian dialect) occupies an intermediate position between Attic and Doric, since the alternations between pitch contours are completely automatic, i.e. the high pitch recedes always to its full limit. Aeolic may contrast two different pitch contours on the penult (minimal pairs like

οἴκου ~ οἴκου are at least theoretically possible) but may not contrast two different pitch contours on the ultima (Attic minimal pairs of the type φῶς ~ φῶς are impossible in Aeolic). In regard to the penult Aeolic looks like a tone-accent type, but in regard to the antepenult and ultima as stress-accent type. In other words, from the point of view of accentuation (disyllabic versus monosyllabic) Attic has disyllabic accentuation on both the penult and ultima, Aeolic only on the penult and Doric has only monosyllabic accentuation:

A T T I C		tone-accent (the accentable unit is mora)			
accentuation		penult = long	penult = short	accentable unit	
	1	ἄνθρωποι	ἄγγελου	3̣ (2)2	1
mono-	2	ἄρχαῖος		3 22	1
di-	3	ἄνθρώπων	ἄγγέλων	3 (2)2̣	11
mono-	4	παῖδες	ἔππος	2̣(2)	1
di-	5	παῖδων	ἔππων	(2)2̣	11
mono-	6	φῶς			1̣1̣
di-	7	φῶς			11̣
A E O L I C		tone-accent (the accentable unit is sometimes mora and sometimes syllable)			
	1=2	ἄνθρωποι, ἄρχαῖος	ἄγγελου	3̣ (2)2	1
	3	ἄνθρώπων	ἄγγέλων	3 (2)2̣	11
mono-	4	παῖδες	ἔππος	2̣(2)	1
di-	5	παῖδων	ἔππων	(2)2̣	11
	6=7	φῶς			1̣1̣
D O R I C		stress-accent (the accentable unit is syllable)			
mono-	1=2	ἄνθρωποι, ἄρχαῖος	ἄγγέλου	3 (2̣)	1
	3	ἄνθρώπων	ἄγγέλων	3 (2̣)	1
mono-	4	παῖδες	ἔππος	(2̣)	1
	5	(παῖδων)	ἔππων	(2̣)	1̣
	6=7	φῶς			1̣1̣

In the case of Aeolic polysyllabic words such as ἄνθρώπων the accentuation was phonetically disyllabic [anthrōpōon]. However, there was no phonemic contrast of monosyllabic and disyllabic accentuation on the penult in polysyllabic words as in Attic: ἄρχαῖος /ark^hai^os/ versus ἄρχαῖου /ark^hai^o/.

It might be of interest to compare the functional load of monosyllabic and disyllabic accentuation in Ancient Greek and Modern Serbo-Croatian dialects (Čakavian and Štokavian), since both show distributional interaction between tone and

vowel length. In the Čakavian dialect of Serbo-Croatian (Belić (1909)), all syllables containing long vowels are intonable (i.e. the contours are contrastive in *any* long syllable not only initially as in Štokavian):

<u>syllable</u>	<u>contour</u>	<u>moraic analysis</u>	<u>(traditional spelling)</u>
long	rising / <u>á</u> /	áá	á
long	falling / <u>â</u> /	ââ	â
short		á	â

In the Štokavian dialect of Serbo-Croatian even short vowels are intonable; consequently, the concept of mora is irrelevant for the description of this dialect. In terms of the traditional Vukovian system, restrictions on the distribution of the two contours are as follows:

- the falling accent occurs only on the first syllable
- monosyllabic words show only falling accent
- internal syllables of polysyllabic words can have only rising accent (they can have falling accent in Čakavian)
- final syllables of polysyllabic words cannot be accented (as in Čakavian)
- length cannot occur before the accent (the length does occur before accent in Čakavian)

<u>syllable</u>	<u>contour</u>	<u>traditional spelling</u>	
long	rising / <u>á</u> /	grádu (Loc)	'city'
long	falling / <u>â</u> /	grâdu (Dat)	'city'
short	rising / <u>ó</u> /	nòsak	'small nose'
short	falling / <u>ò</u> /	nòsak	'easy to carry'

Notice that Serbo-Croatian has 'better' tonal minimal pairs than Attic (discussed under 4.1) which are only of the *grammatical* type (οἶκος 'houses' vs. οἶκος 'in the house'). In addition to examples such as the difference between Dative and Locative found in a large number of words, Serbo-Croatian has examples of *lexical* tone, seen in pairs such as: *mâjka* 'mother' vs. *májka* 'grandmother' or examples whose grammaticality is not so obvious: *pūstīm* 'I empty' vs. *pūstīm* 'I become empty'.

In Štokavian (as shown by Ivić (1958), (1965:136)) the traditional phonetic analysis of four accents can be put in terms of simple phonological analysis, which reinterprets the surface contrast between rising and falling melodic pattern in the same syllable as a difference in the fundamental frequency of the posttonic syllable. The fundamental frequency of the posttonic syllable is higher in the words with rising accents than in words with falling accents.

Thus, according to Ivić (1965:136), there are not four accents but only one with two positional variants: the initial (= falling) and the medial (= rising). The initial variant appears within one syllable (and is therefore *monosyllabic*), whereas the medial variant appears within two syllables (it is *disyllabic*). In his phonemic analysis of Štokavian Ivić marks only the *place* of accent and *quantity*. Thus the above two pairs of words can be distinguished by means of a single accent in its two positional variants:

	<u>location of accent</u>	<u>accentuation</u>
[grā̀du]	/grā'du/	disyllabic
[grā̌du]	/'grā̌du/	monosyllabic
[nô̌sak]	/no'sak/	disyllabic
[nô̌sak]	/'nosak/	monosyllabic

Notice that the place of accent corresponds to the place of the falling glide.

Similarly, in the following contrastive survey of Ancient Greek and Serbo-Croatian we may mark the location of the falling glide in terms of monosyllabic and disyllabic accentuation. Thus the interaction between tone and length in Ancient Greek and Serbo-Croatian disyllabic and trisyllabic words may be formally stated as below:

	<u>Ancient Greek</u>	<u>Serbo-Croatian</u>
Accentuation:	<u>Disyllabic words</u>	(high pitch on the ultima)
	2́ 2́	2́ 2́ (only Čakavian)
	2́ 2́ (only Attic)	2́ 2́
		(high pitch on the penult)
monosyllabic	2́ 2́	2́ 2́
disyllabic	2́ 2́	2́ 2́
	<u>Trisyllabic words</u>	(high pitch on the ultima)
	32́ 32́ 32́ 32́ (only Attic)	32́ 32́ 32́ 32́ (only Čakavian)
	32́ 32́ 32́ 32́	32́ 32́ 32́ 32́
		(high pitch on the penult)
monosyllabic	32́ 32́ 2́ 2́ (only Attic)	32́ 32́ 32́ 32́ (only Čakavian)
disyllabic	2́ 2́ 32́ 32́	32́ 32́ 32́ 32́

(high pitch on the antepenult)

monosyllabic	∅	∅	∅	∅	$\hat{3}21$	$\hat{3}21$	$\hat{3}2\bar{1}$	$\hat{3}\bar{2}\bar{1}$
disyllabic	$\hat{3}21$	$\hat{3}21$	∅	∅	$\hat{3}21$	$\hat{3}21$	$\hat{3}2\bar{1}$	$\hat{3}\bar{2}\bar{1}$

The following observations may be made on the basis of this survey:

1) The distribution of contrastive contours:

Ancient Greek

Attic - long penult and ultima

Aeolic - long penult of disyllabic words (i.e. initially in disyllabic words)

Serbo-Croatian

Čakavian - any long syllable

Štokavian - initially

ii) As mentioned above, in Štokavian final syllables of polysyllabic words cannot be accented (Štokavian retraction of accent took place in the 15th century). Similarly, in Aeolic polysyllabic words the accent has to move as far as permitted by the general limiting rule (see under 4.3.2, p. 154).

iii) Most typically in both 'mora-counting' dialects (Attic and Čakavian) the circumflex may occur on the penult of polysyllabic words while it may not in 'syllable-counting' Aeolic and Štokavian.

Finally, we may proceed to typological classification of several groups of IE language families to show more clearly internal differentiation of the Hellenic branch on the basis of typological parallels. Kiparsky's insightful typology of IE accent (1973) is based on a relationship between accentual mobility and the existence of contour accents. In this connection, we might recall Trubetzkoy's restriction, that only languages with distinctive vowel-length represent a real tone-accent type; contrastive contours, as shown on examples from Ancient Greek and Serbo-Croatian, tend to appear only on syllables containing long vowels (Lehiste (1970:82)). The best known cases are among Slavic and Baltic languages, which are supposed to represent the older IE type (whereas tone-accent of modern Scandinavian and Indo-Aryan languages developed secondarily). What is of interest from the point of view of comparative accentology is the development of secondary fixed accent in all these groups. Thus Latvian, in the Baltic group, immobilized stress-accent on the initial syllable (there are only a

few exceptions) and may be described (Garde (1968:100)) as having a 'quasi-fixed' accent. Similarly, in the West Slavic group Polish immobilized the accent, which is misleadingly described as pitch-accent (Lehiste (1970:133)), on the penultimate syllable; Macedonian in the South Slavic group immobilized its accent, which is a purely stress accent, on the antepenultimate syllable. Ancient Greek, which belongs to the Kentum languages, exhibits parallels reminiscent strongly of the accentual differentiation of Balto-Slavic languages belonging to the Satem subphylum of IE. Attic-Ionic developed contrastive contours by early contractions; Doric presumably fixed the contourless accent of Proto-Greek by analogical levelling of paradigms. On the other hand, Aeolic immobilized its accent purely phonologically by the limiting rule. We may summarize all these data in Table 4-1.

Table 4-1. Accent typology of Balto-Slavic languages and Ancient Greek dialects.

	tone-accent		stress-accent		
	free	quasi-fixed	free	quasi-fixed	fixed
<u>Baltic</u>	Lithuanian	Latvian			
<u>Slavic</u>			Russian	Polish	Czech
(Southern group)	Čakavian	Štokavian	Bulgarian	Macedonian	
<u>Greek</u>	Attic-Ionic	Aeolic		Doric	

4.7 SITUATION IN MODERN GREEK DIALECTS

I will discuss the following Modern and Ancient Greek forms:

Modern Greek Dialects:

<u>Katharevusa</u>					
Sg Nom	ἄνθρωπος		Pl	ἄνθρωποι	
Acc	ἄνθρωπον			ἀνθρώπους	
Gen	ἀνθρώπου			ἀνθρώπου(ν)	
<u>Demotike</u>					
Sg Nom	ἄνθρωπος		Pl	ἄνθρωποι	
				(or ἀνθρώπι)	
Acc	ἄνθρωπο			ἀνθρώπους	
Gen	ἀνθρώπου (or ἄνθρωπου)			ἀνθρώπου(ν)	

Sg Nom	ῥάσκαλος	'teacher'	Pl	ῥάσκαλι
Acc	ῥάσκαλο			ῥάσκαλος
Gen	ῥάσκαλου			ῥάσκαλο(ν)

Ancient Greek Dialects: Attic-Ionic

Sg Nom	ἄνθρῳπος	Pl	ἄνθρῳποι
Acc	ἄνθρῳπον		ἄνθρῳπους
Gen	ἄνθρῳπου		ἄνθρῳπων

Doric

Sg Nom	ἄνθρῳπος	Pl	ἄνθρῳποι
Acc	ἄνθρῳπον		ἄνθρῳπους
Gen	ἄνθρῳπου		ἄνθρῳπων

The preceding page shows the striking identity of the place of accent in Ancient and Modern Greek in the nominal paradigm of the 2nd Declension. The difference, however, is obvious. The vowels of Modern Greek are only of two types: accented and unaccented; whereas in Ancient Greek the distinctive vowel length makes for a fourfold division (long and short accented, long and short unaccented). As we know, the phonological distinction of length was lost sometime at the end of the Graeco-Roman period (about the 3rd c. A.D. according to Allen (1968:89)). Since those times vowel length became only an accentual feature and stopped functioning distinctively.

Thus, in Modern Greek the problem is how to explain synchronically the shift of stress in Gen Sg and Pl, and Acc Pl. The movement of stress in these forms cannot obviously be explained in phonological terms as in Ancient Greek, where the length of the ultima governed the movement (i.e., accent could not be placed on the antepenult if the ultima was long).

Nevertheless, some linguists (Warburton (1970:110), Newton (1972:12)) tried to account for the shift of stress in these forms phonologically by postulating short and long vowels in underlying representations. The strong appeal of this solution seems to be rooted in the striking identity of the place of accent in both Ancient and Modern Greek - in other words, the old limiting rule still 'limits' the accent of Modern Greek by not allowing it to occur more than three syllables from the end. Consequently, the Modern Greek version of the limiting rule has to differ from the old one in one important respect - the 'length' of the three vowels, *i*, *o*, *u* in certain suffixes in Modern Greek (the three above plus the 1st, 2nd, 3rd Sg and 3rd Pl of Act Ind or Perf Pass) is only 'abstract'. The length of

the suffixes is not a feature of the vowels but of the respective morphemes which must be marked for this feature. Thus the old limiting rule could be reworded for the purposes of Modern Greek accentuation as follows:

an acute (high stress) is placed on the penult if the vowel of the ultima belongs to a morpheme marked 'LONG', otherwise on the antepenult (Warburton (1970:111)).

Subsequently, it is necessary to get rid of the feature 'LONG' by another rule of vowel shortening, operating under the same conditions. Thus the derivation of the Gen Sg in Modern Greek (Katharevusa) would be the same as in Ancient Greek, the only difference being the vowel shortening rule, which must be ordered after the antepenult rule in Modern Greek:

	<u>Modern Greek</u>	<u>Ancient Greek</u>
	(Katharevusa)	
	άνθροπῦ	άνθροπῦ
<i>Limiting rule</i>	ανθρόπῦ	ανθρόπῦ
<i>Vowel Shortening</i>	ανθρόπου	-

However, new problems emerge. These concern the accentuation of certain forms in Demotike such as Gen Sg *ῥάσκαλυ* (or even *άνθροпу*). In terms of abstract phonology the first form could be derived from the same underlying representation as that of Katharevusa by blocking the limiting rule:

	<u>Katharevusa</u>	<u>Demotike</u>	
	άνθροпῦ	άνθροпῦ	ῥάσκαλῦ
<i>Limiting rule</i>	ανθρόпῦ	-	-
<i>Vowel Shortening</i>	ανθρόпу	άνθροпу	ῥάσκαλυ

On the basis of these phenomena we may conclude that the old limiting rule does not govern the movement, in many instances, in the Gen Sg (especially of compound nouns, e.g. *άντιέχου* 'of the echo' and proper names, e.g. *Χριστόφορου* 'of Christopher').¹⁶ On the other hand, the accent may move against all expectations (based on the old limiting rule) in Nom Pl *ανθρόπι* (versus Katharevusa *άνθροπι*, cf. Classical *άνθρωποι*), *ῥάσκαλι* etc. All these difficulties (unnatural underlying representations containing a feature, which never appears in any of Modern Greek dialects; vowel shortening rule, which is motivated only by this artificial underlying representation) seem to indicate that we should be looking for the real solution not in the framework of abstract phonology but rather in terms of concrete morphology. More recently, Warburton (1976:259) showed that a natural way to

account for the accentual changes of Modern Greek is not to postulate abstract length in underlying representations but to consider morphological criteria. The essence of her proposal is based on the accentual dichotomy of the verbal and the nominal part of the lexicon. We may recall the well-known phenomenon of the verb's 'recessive' accent in Ancient Greek - the limiting rule simply 'predicts' the accent on all verbal forms - which thus may be considered underlyingly *unaccented*. On the other hand, nouns were underlyingly *accented* in Attic-Ionic (but not in Aeolic, see p. 170). Similarly for Modern Greek, Warbarton suggests that verbs are to be considered underlyingly unaccented, whereas the nouns have to be marked for accent. With the exception of the Gen Sg, Gen Pl, and Acc Pl, the nouns of the 2nd Declension, which are stressed underlyingly on the antepenult, keep their accent.

Since these three suffixes do not form any natural morphological class they have to be learned as 'exceptions' by each new generation of speakers of Modern Greek. It is easy to imagine that various speakers will reinterpret these alternations differently.¹⁷ In other words, the paradigm of *ánthropos* is exposed to analogical levelling of accent. A result of this analogizing is an opposition *en bloc* of the singular (antepenult accentuation) and the plural forms (penult accentuation):

Sg Nom	ánthropos	Pl	anθrópi
Acc	ánthropo		anθrópus
Gen	ánthropu		anθrópon

However, as commented by Warburton (1976:267),

This reinterpretation has not become established in the language because it involves changes that are counter-acted by standardization and education and also because it goes against the tendency to columnal accentuation (retain stress as far as possible).

The best we can do in describing a similar situation is to say that speakers of Demotike tend to minimize the mobility of accent within a nominal paradigm, which is typical of Katharevusa. This is not surprising since parallels of the immobilization of accent within a nominal paradigm are available from other languages. In Russian about 90% of nouns have fixed accent - however, the remaining 10% have mobile accent. Among these 10% there are fairly common nouns such as *golová* 'head' and *ruká* 'hand':

Sg Nom	golová	ruká
Acc	gólovu	rúku

Pl Nom	gólovy	rúki
Gen	golóv	rúk
Dat	golovám	rukám

A look at these forms in Byelorussian will reveal that a far-reaching reinterpretation of the nominal paradigms took place here. The accent does not shift leftwards in the Acc Sg (Acc was the only one among six cases showing this shift); the plural forms of *galavá* have the fixed accent on the second syllable of the stem (plural forms of *rúki* (Dat, Loc, Instr) with mobile accent are classifiable as 'semantic' cases in both Russian and Byelorussian):

Sg Nom	galavá	ruká
Acc	galavú	rukú
Pl Nom	galóvy	rúki
Gen	galóv	rúk
Dat	galóvam	rukám

Returning to Greek we may notice that similar phenomena of accent immobilization exist in verb paradigms. In the Passive Imperfect the shift of accent characterizes 1st Person of both numbers only in Katharevusa, while Demotike shows stress distributed columnarly in all forms:

<u>Katharevusa</u>	Sg 1	ἐλεῖλόμην	<u>Demotike</u>	1	ἐλεῖλόμου
	2	ἐλεύπεσο		2	ἐλεῖλόσου
	3	ἐλεύπετο		3	ἐλεῖλόταν
	Pl 1	ἐλεῖλόμεθα		1	ἐλεῖλόμαστε
	2	ἐλεύπεσθε		2	ἐλεῖλόαστε
	3	ἐλεύποντο		3	ἐλεῖλόνταν

It is a pity that our Doric data do not allow us to make any conclusions about the accentuation of singular forms of the 2nd Declension, which were accented on the antepenult in Attic-Ionic. However, we know that Nom Pl forms were accented on the penult, not on the antepenult as in Attic (in the Laconian dialect of Alkman there are forms such as ἀγγέλου, ἀνθρώπου (see Schwyzer (1939:384)). It could be that there has been a trend in Classical Doric dialects to immobilize the accent in nominal paradigms. As shown under 4.3.2, there has been a trend in Doric and Hellenistic Greek, to immobilize the accent in verb paradigms. In both cases, a shift of the accent, which is in perfect agreement with the *phonological* rule of limitation, causes 'irregularity' in *morphology* - the shift of accent introduces allomorphy the functionality of which is exposed to reinterpretation by learners of the language:

	<u>Attic</u>	analogy	<u>Doric</u>
P1 Nom	άν ^h ρῶ [̄] ποι	→	αν ^h ρῶ [̄] ποι
Acc	αν ^h ρῶ [̄] π [̄] ς		αν ^h ρῶ [̄] π [̄] ς
Gen	αν ^h ρῶ [̄] π [̄] ων		αν ^h ρῶ [̄] π [̄] ων
P1 1	ε [̄] λάβομεν		ε [̄] λάβομεν
2	ε [̄] λάβετε		ε [̄] λάβετε
3	ε [̄] λαβον	→	ε [̄] λάβον
			ε [̄] λάβοσαν (<u>Hellenistic</u>)

NOTES

- 1 There are quite numerous cases breaching the general limiting rule, arising as a result of the Attic-Ionic metathesis of vowel-length, which followed the date of fixation of the accent - so far the traditional explanation. These cases include:

a) Genitives in -εω (= 1st Decl Masc), e.g. Ἀτρεΐδεω

Atreidāo

Fronting

Atreidāo

Raising

Atreidēo

Metathesis

Atreideō

b) so-called Attic declension ἔλεως 'gracious' (ἑλᾱος → ἑληος → ἔλεως)

<u>Homeric</u>	<u>Fronting-Raising</u>	<u>Metathesis</u>	<u>Analogical stress levelling</u>
ἑλᾱος	ἑληος	ἑλεως	
ἑλᾱου	ἑλήου	*ἑλέω	ἑλεω
ἑλᾱψ	ἑλήψ	*ἑλέψ	ἑλεψ
ἑλᾱον	ἑληον	ἑλεων	

Notice that the metathesis of vowel-length still does not explain the retraction of accent in Gen and Dat Sg and the location of accent must be explained as due to the analogy with strong cases. It seems, however, that these two forms can be derived from /hēlāo/ and /hēlāoi/; see the derivation of all forms:

	Nom Sg	Gen Sg	Dat Sg	Acc Sg
	hēlāos	hēlāo	hēlāoi	hēlāon
<i>Fronting</i>	hēlāos	hēlāo	hēlāoi	hēlāon
<i>Raising</i>	hēlēos	hēlēo	hēlēoi	hēlēon
<i>Metathesis</i>	hēlēos	hēlēō	hēlēoi	hēlēon

c) the Genitive of the 3rd Declension nouns with stems in -i and -u e.g. πόλεως and πήχεως. Again both forms are explainable by metathesis from *pólējos* and *pākēwos*.

However, there is no such explanation for the Gen Pl $\pi\acute{o}\lambda\epsilon\omega\nu$, and only the paradigmatic levelling, which limits the permutation of accent within the paradigm, will work. On the other hand, both forms $\acute{\alpha}\sigma\tau\epsilon\omega\nu$ and $\acute{\alpha}\sigma\tau\acute{\epsilon}\omega\nu$ are documented, which indicates that the allomorphy within the paradigm was minimized only optionally. Notice that typologically the same situation exists in Modern Greek: Gen Sg $\acute{\alpha}\nu\theta\rho\acute{\omega}\pi\omicron\upsilon$ 'man' and $\delta\acute{\alpha}\sigma\kappa\alpha\lambda\omicron\upsilon$ 'teacher' (Demotike). The general rule was formalized by Kiparsky (1967a):

$$V \rightarrow \acute{V} / \text{--- } C_0 V_0 C_0 V_0^1 C_0 \#$$

This schema functions as shown below for $\acute{\alpha}\sigma\tau\upsilon$ 'city', $\sigma\acute{\omega}\mu\alpha$ 'body', $\sigma\acute{\omega}\mu\alpha\tau\omicron\varsigma$ (Gen Sg), $\sigma\omega\mu\acute{\alpha}\tau\omega\nu$ (Gen Pl), $\phi\acute{\omega}\varsigma$ 'light':

	a		st	u
s	o		o	m a
so	o	m	a	t o s
soom	a	t	o	o n
ph	o			o s
-	C ₀	V ₀	C ₀	V ₀ ¹ C ₀ #

- 2 Doric $\phi\epsilon\rho\omicron\mu\acute{\epsilon}\nu\omicron\upsilon$ (Masc Pl) is postulated on the basis of documented Doric forms such as $\tau\upsilon\pi\tau\omicron\mu\acute{\epsilon}\nu\omicron\upsilon$, $\kappa\alpha\lambda\omicron\upsilon\mu\acute{\epsilon}\nu\omicron\upsilon$ (versus Attic $\tau\upsilon\pi\tau\acute{o}\mu\epsilon\nu\omicron\upsilon$, $\kappa\alpha\lambda\omicron\upsilon\acute{\mu}\epsilon\nu\omicron\upsilon$). See Thumb-Kieckers (1932:76).
- 3 According to Kurylowicz (1958:158) circumflex in pro-nominal Gen Pl Masc in Doric $\acute{\alpha}\lambda\lambda\acute{\omega}\nu$, $\tau\eta\nu\acute{\omega}\nu$, $\tau\omicron\upsilon\tau\acute{\omega}\nu$ results from an analogical extension from the Gen Pl Fem (where circumflex results from the contraction $\bar{a} + \bar{o}n \rightarrow \bar{a}n$):

	Feminine	Masculine
Pl Nom	$\acute{\alpha}\lambda\lambda\alpha\iota$	$\acute{\alpha}\lambda\lambda\omicron\iota$
Gen	$\acute{\alpha}\lambda\lambda\acute{\alpha}\nu$	$\acute{\alpha}\lambda\lambda\acute{\omega}\nu$

An analogy in the opposite direction took place in Attic-Ionic:

	Feminine	Masculine
(instead of $*\delta\iota\kappa\alpha\tau\alpha\iota$) Pl Nom	$\delta\acute{\iota}\kappa\alpha\iota\alpha\iota$	$\delta\acute{\iota}\kappa\alpha\iota\omicron\iota$
(instead of $*\delta\iota\kappa\alpha\iota\acute{\omega}\nu$) Gen	$\delta\iota\kappa\alpha\acute{\iota}\omega\nu$	$\delta\iota\kappa\alpha\acute{\iota}\omega\nu$

However, an analogical extension cannot explain circumflex in nominal Gen Pl Masc $\pi\alpha\iota\delta\acute{\omega}\nu$, $\tau\rho\omega\acute{\omega}\nu$.

	<u>Proto-Greek</u>	<u>Attic</u>	<u>Doric</u>
Sg Nom	$p\acute{a}wis$	$\pi\acute{\alpha}\tau\varsigma$	$\pi\acute{\alpha}\iota\varsigma$
Gen	$p\acute{a}wid\omicron\varsigma$	$\pi\alpha\iota\delta\acute{o}\varsigma$	$\pi\alpha\iota\delta\acute{o}\varsigma(?)$
Pl Nom	$p\acute{a}wides$	$\pi\acute{\alpha}\tau\delta\epsilon\varsigma$, $\tau\rho\acute{\omega}\epsilon\varsigma$	$\pi\acute{\alpha}\iota\delta\epsilon\varsigma$, $\tau\rho\acute{\omega}\epsilon\varsigma$
Gen	$paw\acute{id}\omicron\theta\eta$	$\pi\acute{\alpha}\iota\delta\omega\nu$, $\tau\rho\acute{\omega}\omega\nu$	$\pi\alpha\iota\delta\acute{\omega}\nu$, $\tau\rho\omega\acute{\omega}\nu$

Taking into account the situation in reconstructed Proto-Greek, Attic $\pi\acute{\alpha}\iota\delta\omega\nu$ very likely shows the original accent $*paw\acute{id}\omicron\theta\eta \rightarrow \pi\acute{\alpha}\iota\delta\acute{\omega}\nu$. On the other hand, Doric regularized the paradigm in that this noun is accented

like monosyllabic nouns inherited from PIE, which have desinential accent in weak cases (γύψ 'vulture' versus γυῖος, γυῖες versus γυῖων). This represents an innovation of Doric, which could take place only after the disyllabic *pávis was no longer synchronically recoverable (= after the restructuring *disyllabic noun* → *monosyllabic noun* took place).

- 4 Kurylowicz (1958:157) explains Doric paroxytons, corresponding to Attic properispomenons, as a result of the Doric innovative process labelled 'paroxytonèse':

il paraît que la paroxytonèse ≈ υ > ε υ des formes γυναικές, παῖδες, ... est une innovation doriennne. C'est que nous font supposer les corollaires morphologiques du changement ε > ε (παλῖον: πόδιον, ψυχοπομπός: πατροκτόνος) qui ne paraissent pas bornés à l'ionien-attique.

Furthermore, Kurylowicz comments on the correspondence between Doric paroxytons and Attic proparoxytons (p.158):

le changement ≈ υ > ε υ éclaircit l'accentuation inattendue ἀγγέλου, ἀνθρώποι etc. L'assimilation de ≈ ου à ε ου provoque nécessairement celle de εχ - ου à χχ - ου parce que ≈ ου et εχ - ου, ε ου et χχ - ου représentent des couples dont les membres sont isofonctionnels au point de vue de l'accentuation. C'est à dire que la suppression de la différence entre οἴκοι et οἴκοι (> οἴκοι) entraîne le déplacement ἀποικοι > ἀποῖκοι.

I certainly do not see how the suppression of the difference between οἴκοι and οἴκοι could entail a rightward shift of accent in Doric. The alleged suppression is a fact of simple neutralization (= synchronic process), while the rightward shift of accent in ἀποικοι represents a historical metatony (or better analogical stress levelling with other members of the paradigm); consequently I do not see any casual nexus between these two.

- 5 The uncontracted forms of the Gen and Dat Sg are postulated on the basis of documented forms such as Gen Pl εὔνοων (Thuc. 6.64), elsewhere εὔνοων.
- 6 Ancient writers variously ascribe the Hellenistic type ἐλάβοσαν to Boeotian, Doric, Chalcidian, Alexandrian, οἱ τῇ 'Ασυνῇ φωνῇ and οἱ ἐλληνίζοντες ἐν Κιλικίᾳ See Hainsworth (1967:73).
- 7 Kurylowicz's explanation (1958:159) of why in Doric the accent in the 3rd Pl Imperfect is located on the penult (e.g. ἐφέρον, ἐλάβον) runs as follows:

Par opposition à -ον de la 1re p. sing. les désinences fondées -αν, -εν, -ον furent appréciées

comme -ᾱν, -ην, -ων avec abrègement morphologique de la voyelle longue. Mais la longueur postule l'accentuation de la pénultième. Au point de vue structural une forme comme ἑλάβον serait donc d'abord, avant la limitation de l'accent, appréciée comme *ἑ'λαβων > ἑ'λαβον (abrègement morphologique), puis, après la limitation, *ἑ'λαβων > *ἑ'λάβων (déplacement de l'accent) > ἑ'λάβον (abrègement morphologique). Car au point de vue structurel le fait morphologique (l'abrègement) se superpose au fait phonologique (limitation).

- 8 This claim is based on the following observations:

	<u>Lithuanian</u>	<u>Greek</u>
Strong case	gálvos 'heads' (Nom Pl)	phugᾱs (Acc Pl)
Weak case	galvōs (Gen Sg)	phugēs (Gen Sg)
	galvomīs (Instr Pl)	

While Greek is accented by IE rules

1) Strong cases have presuffixal accent

2) Weak cases have post-stem accent

these rules are replaced in Lithuanian by Baltic rules

1') Strong cases have word-initial accent

2') Weak cases have word-final accent

<u>Lithuanian</u>	<u>Greek</u>	Cf.
Nom Pl *galv+aa+s	Acc Pl phug+aa+s	pód+a
Gen Sg *galv+aa+s	Gen Sg phug+ée+s	pod+ós
Instr Pl *galv+aa+mis		

The IE ancestor of Lithuanian after application of Baltic rules 1' and 2' yields the correct accent and contour for Lithuanian, i.e. in Instr Pl the new marginal alternation puts the accent in prepausal environment and in Gen Sg, where the shift occurs in the same syllable, the high pitch shifts to the second mora. In Nom Pl the new marginal alternation puts the accent on the initial syllable:

Nom Pl	gálv-aa-s	gálvos
Gen Sg	galv-aá-s	galvōs
Instr Pl	galv-aa-mīs	galvomīs

- 9 Any analysis of Greek which fails to distinguish between prehistoric and late Greek contractions (even if the rules are the same!) is heading for serious confusions.

Prehistoric contractions

inside morpheme-boundaries	dówelos	→ δοῦλος
	tīmá+ēs	→ τῆμῆς
across morpheme-boundaries	tīmá+ei	→ τῆμῆι
(thematic vowel + ending)		

Historical contractions

across morpheme-boundaries	sūké+ā	→ συκῆ
	sūké+ās	→ συκῆς
(thematic vowel + ending)	sūké+ai	→ συκῆι
	sūké+ān	→ συκῆν

- 10 It is tempting to 'explain' the split in contour accents between the strong and weak cases of thematic oxytones in Attic by drawing on dialect mixing. Western Attic was under the influence of Boeotian (= Aeolic dialect) since the sub-Mycenaean period and Ionic spoken in the Saronic gulf was overlaid by Doric dialects before the end of the 2nd Millenium. Thus, the Attic accent pattern in thematic oxytones may be said to represent a mixture of both Aeolic type (in weak cases) and Doric type (in strong cases):

<u>Aeolic</u>	<u>Attic</u>	<u>Doric</u>
ῥεῶ	ῥεῶ	ῥεῶ
ῥεῶν	ῥεῶν	ῥεῶν
ῥεῶς	ῥεῶς	ῥεῶς
ῥεῶ	ῥεῶ	ῥεῶ

- 11 Kiparsky (1973:800) wonders why the weak cases (= Gen, Dat) show a forward shift in athematic nouns, but a backward shift in the thematic nouns and consequently the accentual relationship between the two classes is just the reverse of what we might have expected. However, as shown above the backward shift in the thematic nouns takes place only in oxytones (feminine), whereas in proparoxytones and properispomenons of both genders the forward shift is as normal as in the athematic nouns:

Acc Sg	Gen Sg
pód - a	pod - ós rightward shift
basílei - a	basileí - aas
spháir - a	sphaír - aas
but	
thē - aán	the - áas leftward shift

- 12 I base this assumption on data such as χθόνος (vs. Attic χθονός) in Alcaeus B1010 (Lobel (1927:14)). This Aeolic accentual shift is quite remarkable since mobile athematic monosyllables survived until Modern Greek times (πᾶν, παντός 'everything'; φῶς, φωτός 'light'). On the other hand, immobile athematic monosyllables occurred even in Vedic, e.g. *śvān*, *śúnas* (Gen) 'dog' (cf. Aeolic κύνος vs. Attic κυνός).
- 13 As I see this problem *one* of the reasons for the mobility of accent in PIE monosyllabic athematic nouns was to avoid homonymic clashes. Thus, in Vedic Gen Sg (or Acc Pl) *pádás* 'foot, step' (*pāt*) would be homophonous, if accented on the root, with Nom Sg *pádas* 'step, stride, foot'. There are quite a few examples like those listed below, where the only difference between the two different lexical items is the location of accent. On the other hand, notice that Acc Sg *pādam* 'foot, step' (*pāt*) is

homophonous with Acc Sg *pādam* 'foot, bottom, fourth part' (*pādas*). See Macdonell (1916) for data.

Athematic Monosyllabic Nouns

(movable stems)

pāt 'foot, step', (Gen Sg) *padás*

Thematic Nouns

(fixed stems)

pādas 'step,

stride'

vāk 'speech,
voice'

(Instr Sg) *vāčā*

(Nom Sg) *vācā* 'speech,

word'

(Gen Pl) *vācām* (Acc Sg) *vācām*

sāt 'victorious'

(Gen Sg) *sahas*

(Nom Sg) *sahas* 'powerful'

ap 'water'

(Gen Sg) *apas*

(Nom Sg) *apas* 'work'

- 14 Actually there are some underlyingly accentable morphemes even in Lesbian, e.g. prepositions and conjunctions are accented on the ultima as in other dialects: *ἀνὰ*, *διὰ*, *κατὰ*, *ἄταρ* (Schwyzer (1938:383)).

- 15 This statement oversimplifies the issues. Tone-accent languages with a polysyllabic type of accentuation such as Latvian and some nonstandard Lithuanian dialects make tonal distinctions even in unstressed syllables. In the Zemaitish (Samogitian) dialect of Lithuanian the stress was retracted from a circumflex accented syllable to the initial syllable and the initial syllable received a new intonation (acute if the previously unstressed syllable was acute, and middle tone if the initial syllable was circumflex).

- 16 According to Householder et al. (1964:54), the Gen Sg and the Gen and Acc Pl of proparoxytone substantives are stressed on the penult, but the stress remains on the antepenult in the Gen Sg of some compound nouns, some (especially family) names - e.g. *ἀντίλαλος* 'echo', Gen Sg *ἀντίλαλου*; *μανδρόσκυλον* 'sheep dog', Gen Sg *μανδρόσκυλου*, Gen Pl *μανδρόσκυλων*. Furthermore, some substantives occur with or without stress alternation in the plural - e.g. *συνπέθερος* 'child's father-in-law', Gen Sg *συνπέθερου*, Gen Pl *συνπέθερων* ~ *συνπεθέρων*, Nom Pl *συνπέθεροι* ~ *συνπεθέροι*. The shift in the Nom Pl was formerly common on all proparoxytones and it is still common with some nouns - e.g. *δασκάλοι* 'teachers'.

- 17 At this point we may recall Kuryłowicz's statement (1945-1949:37):

il résulte d'un système grammatical concret quelles transformations "analogiques" sont possibles...mais c'est le facteur social...qui décide si et dans quelle mesure ces possibilités se réalisent...les actions de l'"analogie" ne sont pas des nécessités.

Interplay between Sound Change and Analogy

5.1 PERSONAL ENDINGS OF THEMATIC AND ATHEMATIC VERBS

In my discussion of personal endings I will be frequently referring to PIE, Vedic and Avestan forms, which I list below:

		<u>Indicative</u>	<u>Subjunctive</u>	
<u>PIE</u>	Sg 2	bhéresi	bhéréś	
	3	bhéreti	bhéréť	
	Pl 3	bhéronti	*bhérōnt	
<u>Vedic</u>		bhárasi	bhárās(i)	
		bhárati	bhárāt(i)	
		bháranti	bhārān	
<u>Avestan</u>		barahi	barāhi	
		baraiti	barāit(i)	
		barainti	barān	
				<u>Athematic Verb</u>
<u>Proto-Greek</u>		phéresi	phérēs(i)	títhēsi
		phéreti	phérēt(i)	títhēti
		phéronti	phérōnt(i)	títhēnti

Kiparsky (1967b:112) proposed a metathesis rule describing an early sound change which took place in the prehistory of Greek. This rule inverts word-final *-i* with preceding dental consonants, which were probably palatalized in this position. By this rule PIE 2nd Sg **légesi* becomes Greek λέγειν, and 3rd Sg **légeti* becomes **légeit*, which then turns into λέγειν by the Greek loss of word-final obstruent stops (cf. **sōmat* → σῶμα). In the same way the corresponding PIE subjunctives (reconstructed by Brugmann, *Grundriss II*. 3538) *legēsi* and *legēti* develop into Greek λέγῃς /légēis/ and λέγῃ /légēi/. However, there are several dialectal variants of the 3rd Sg Subjunctive:

λέγη	Attic
λέγη	Arcadian, Cypriot, Boeotian, Elean
λέγησσι	Homeric

A common source of both λέγη and λέγη, according to Schwyzer (1938:661), is PIE *legēt*. This form after the loss of word-final *-t* gives Arcadian etc. λέγη. The Attic λέγη is explained by the analogy with indicative λέγεσσι.

According to Kiparsky the form **legēt* is only a superficially plausible comparison with Vedic subjunctive *bharāt*, which furthermore seems to ignore the fact that subjunctives of the type λέγη are restricted in two ways. First, they occur only in the 3rd Pers Sg, whereas the secondary endings in the Vedic subjunctive are not restricted. Second, subjunctives of the type λέγη, apart from scattered examples elsewhere, occur only in two dialect areas: in the Aeolic group (Thessalian, Boeotian, isolated examples also in Lesbian) and in Arcado-Cypriot (no decisive examples in Cypriot).

Kiparsky modifies his metathesis rule to explain forms like λέγησσι, which occur in the Homeric dialect. The final *-i*, which would be obliterated by the metathesis rule, must optionally be retained. This revision would then generate *legēti* → *legēiti*, which would yield Homeric λέγησσι (after affrication and frication *t* → *tʰ* → *s* before front vowels). Kiparsky's two versions of the metathesis rule are as follows:

- a) $\begin{bmatrix} - \text{ cons} \end{bmatrix}$ $\begin{bmatrix} + \text{ cons} \\ - \text{ grave} \end{bmatrix}$ $\begin{bmatrix} - \text{ cons} \\ - \text{ grave} \\ + \text{ diffuse} \end{bmatrix}$ #
- 1 2 3 4
- Structural change: 1 2 3 4 $\Rightarrow$ 1 2 3 4
 e.g. *ēti* $\Rightarrow$ *ēit*
- b) structural change 1 2 3 4 $\Rightarrow$ 1 3 2 3 4
 e.g. *ēti* $\Rightarrow$ *ēiti*

It is worth mentioning that there is support for the metathesis rule outside of Greek in Avestan. Compare some Avestan and Aeolic forms:

Avestan		Indicative	Subjunctive
	Sg 2	barahi	barāhi
	3	baraiti	barāiti or barāts
	Pl 3	barainti	baran
Aeolic	Sg 2	φέρεις	φέρης
	3	φέρει	φέρησι (Homeric)
	Pl 3	φέρουσσι	φέρωσι

As is obvious, the environment of metathesis (b) in Avestan is limited to dental stop and nasal; but metathesis did not take place before the dental fricative *s*, which later changed to *h*. In Greek, the environment of metathesis (b) includes the dental fricative *s*. However, even before the dental stop metathesis (b) was only optional in Avestan, as shown by the alternating form of the 3rd Sg *barāts*. The sequence of historical sound changes may be reconstructed in this fashion.

	<u>Avestan</u>			
	barāsi	barāti	barāti	baranti
Metathesis (b)	-	barāiti	-	barainti
Fricative Weakening	barāhi	-	-	-
Affrication	-	-	barāt ^s i	-
i-Loss	-	-	barāt _s	-
	<u>Aeolic</u>			
	phérēsi	phéreti	phérēti	phéronti
Metathesis (a)	phérēis	phéreit	-	-
Metathesis (b)	-	-	phérēiti	phérinti
t → Ø / -	-	phérei	-	-
Affrication	-	-	phérēitsi	phérintsi
Frication	-	-	phérēisi	phérintsi
n → Ø	-	-	-	phéroisi

At this point we can demonstrate that the traditional assumption regarding the derivational history of φέρων (from *pherēsi) and Homeric φέρων (from *pherēti) is wrong. Schwyzler (1938:661) suggests that fricative weakening (*s* → *h* → Ø) took place in the PIE personal endings *-esi* and *-ēsi* (apparently because it undoubtedly took place in Avestan) and derives these two forms as follows (the formalization is mine):

	phérēsi	phérēti
Fricative Weakening	phérēhi	-
h-Loss	phérēi	-
Affrication	-	phérēt ^s i
Frication	-	phérēsi
Metathesis	-	phérēisi

-s in the 2nd Sg Subj is explained as analogical with other forms, such as the Optative. But this is completely unnecessary if we assume with Kiparsky that there were sound changes, which were formalized by him as two versions of the metathesis rule. But above all, the mistake of various traditional hypotheses consists of the assumption that fricative weakening and subsequent loss of *-h-* obliterated the crucial *-s-* of the ending *-esi* (as in *genesos → genehos

→ *geneos* → γένους). This assumption seems to be rooted in the Neogrammarian belief that sound change is 'blind', and in our concrete case it could be supported by the observation that this change really took place in Avestan (compare *barahi* with Vedic *bharasi*).¹ Finally, that this assumption is totally mistaken can be demonstrated by its application to the indicative endings, where it would necessitate the derivation of φέρει from *phéreti via *phéresi* (!), and the -s in the 2nd Sg would again have to be explained as analogical, although its source would remain unclear:

	phéresi	phéreti
<i>Fricative Weakening</i>	phérei	-
<i>Affrication + Frication</i>	-	phéresi
<i>Fricative Weakening</i>	-	phérei

Further complications emerge if we try to apply metathesis rules on athematic verbs. The main problem here is that postulated underlying forms of the Indicative of athematic verbs, *tithēsi and *tithēti, correspond to the underlying forms of the Subjunctive of thematic verbs, *legēsi and *legēti. Homeric forms τίθευς, τίθει (versus Attic τίθης, τίθησι) are derived from these underlying forms by Kiparsky in the following fashion:

	títhēsi	títhēti
<i>Metathesis (α)</i>	títhēis	títhēit
<i>Osthoff's Law</i>	títhēis	títhēit
<i>t</i> → ∅ / - #	-	títhēi

The traditional solution (see Thumb-Scherer (1959:277)) is definitely much simpler: athematic verbs began being inflected as thematic verbs (φέρεις, φέρει → τίθευς, τίθει instead of τίθης, τίθησι). In other words, the thematic endings were extended from thematic verbs to the athematic ones. Furthermore, Kiparsky's process analysis cannot explain the fact that some originally athematic verbs began being inflected as contract (thematic) verbs in West Ionic dialects. Thumb-Scherer (1959:280), for example, provide the forms τιθεῖν (Eretria and Oropos), καθιστᾶν (Eretria), δίδοῦν (Oropos) etc.; there are also literary forms like τιθεῖ, δίδοῖ, supported by inscriptional forms δίδοῖ in Miletos and Samos. However, my basic objection concerns the use of Osthoff's Law, which is a diachronic rule of Greek (or better, a synchronic rule of Mycenaean Greek, see Lejeune (1972:220)) in a synchronic derivation.

Arcado-Cypriot and Aeolic Subjunctive forms like τίθη are explained by Kiparsky by a monophthongization rule, applying to word-final long diphthongs (which are preserved in Attic

λέγῃ). This seems to be a likely explanation in the framework of process analysis:

	títhēti
Metathesis (b)	títhēit
t → ∅ / — #	títhēi
Monophthongization	títhē

Yet even here the traditional solution - see Buck (1955:119) - surpasses the above solution in its simplicity. Buck assumes that the original endings of the Subjunctive were *-ēs and *-ē; later on, they were replaced by -ēis and -ēi by analogy to the indicative -εῖς and εἰ; but only in Arcado-Cypriot and Aeolic dialects was the original 3rd Sg -ē preserved. What this means is that Buck reconstructs the Proto-Greek Subjunctive forms *phérēs and *phérēt with secondary endings. (Kiparsky works with the forms *phérēsi and *phérēti showing primary endings). The only difficulty of Buck's hypothesis consists in the fact that there is no evidence for the 2nd Sg Subj *phérēs which seems to be peculiar in view of the preserved 3rd Sg Subj phérē. However, this objection might be obviated by showing that such a form in the case of athematic verbs would be homonymous with the 2nd Sg Indic túēs (but there is also túēthā). In terms of external comparative evidence it is hard to prefer either one of the two reconstructions, since Vedic shows both primary and secondary endings in the 2nd and 3rd Sg Subj bhārās(i) and bhārāt(i) (but only a secondary ending in the 3rd Pl Subj bhārān).

Another difficulty appears in deriving Attic forms túēs and túēthē by means of the alternate form of the metathesis rule (b), which leaves the final vowel in place. Metathesis (a) is out of question for the sake of the 3rd Pers túēthē. Now the problem is to eliminate long diphthongs in medial position by monophthongization (Osthoff's Law does not apply here):

	títhēsi	títhēti
Metathesis (b)	títhēisi	títhēiti
Monophthongization	títhēsi	títhēti
Frication	-	títhēsi
i → ∅	títhēs	-

What happens in this case is that there appear intermediate forms which are identical with underlying forms. Consequently, we can assume that neither metathesis (b) nor (a) applied in Attic and we obtain the following scheme (a lower part of the above scheme):

	títhēsi	tít ^h ēti
Frication	-	tít ^h ēsi
i → Ø	tít ^h ēs	-

The loss of final *-i* in the primary ending of the 2nd Sg is to be understood as a simple resolution of a homonymic clash, which was a result of the East Greek palatalization and frication of /t/ before /i/.

Finally, let us compare the derivation of all the above forms according to Kiparsky with a formalized traditional solution. Notice that, according to Kiparsky, Osthoff's Law cannot apply in the Subjunctive of thematic verbs in the Homeric dialect (although it applies in athematic verbs). If it applied the forms of the 2nd and 3rd Sg Subjunctive would be identical with the corresponding Indicative forms. In my view, the invocation of Osthoff's Law in this case is spurious, since the long diphthong of the Subjunctive represents an exception to Osthoff's Law.

In summary, Attic forms of the Subjunctive φέρῃς and φέρῃ may be explained (a) as analogous to the Indicative φέρεις and φέρει (Buck) or (b) as a result of metathesis of Proto-Greek *phérēsi and *pherēti (Kiparsky).

I am inclined to favour the traditional solution since, in my view, Homeric forms τῖθεις and τῖθει are definitely analogical formations with thematic verbs. In addition certain Doric forms are undoubtedly to be analyzed as analogical formations. The ending of the 2nd Sg Ind in Cypriot ἔρπες = ἔρπευς 'creep' (Hesychius), συρῖσδες = συρῖζεις 'pipe' (Theocritus), is obviously a secondary ending extended analogically in the Present from the Imperfect. It is unlikely that these forms are a result of the loss of *-i* in the primary ending **-esi* (*phéresi → phéres → tithēsi → tithēs) in view of all we know about the history of primary and secondary endings.

5.2 ATHEMATIC INFLECTION OF CONTRACT VERBS

The athematic inflection of contract verbs (s.c. 'Aeolic' inflection) is characteristic of some Aeolic dialects (Lesbian and Thessalian of Pelasgiotis) and Arcado-Cypriot. For Boeotian, the ancient grammarians teach the athematic inflection (Sg 1 φύλειμι, Pl 3 φύλεντι); this however is not supported by the evidence of inscriptions (Impf ἐπολέμιον = ἐπολέμεον, Participle πολυόμενος = πολεόμενος, both with height dissimilation).

In Lesbian, according to one grammatical papyrus (see Thumb-Scherer (1959:102)), contract verbs are inflected in certain forms as athematic verbs:

	THEMATIC VERBS				ATHEMATIC VERBS	
<u>Kiparsky (1967b)</u>	Indicative		Subjunctive			
	<u>AEOLIC</u>					
<i>Metathesis (a)</i>	*phéresi	*phéreti	*phérēsi	*phérēti	*títḥēsi	*títḥēti
<i>t</i> → ∅ / — #	phéreis	phéreit		phérēit	-	tithēit
<i>Monophthongization</i>	-	phérei		phérēi	-	tithēi
<i>i</i> → ∅	-	-	?	phérē	-	tithē
					tithēs	
	<u>HOMERIC</u>					
<i>Metathesis (a)</i>	phéreis	phéreit	phérēis		tithēis	tithēit
<i>Metathesis (b)</i>	-	-	-	phérēiti	-	-
<i>Osthoff's Law</i>	-	-	-	-	tithēis	tithēit
<i>t</i> → ∅ / — #	-	phérei	-	-	-	tithēi
<i>Frication</i>	-	-	-	phérēisi	-	-
	<u>ATTIC</u>					
<i>Metathesis (a)</i>	phéreis	phéreit	phérēis	phérēit	-	-
<i>Metathesis (b)</i>	-	-	-	-	tithēisi	tithēiti
<i>Monophthongization</i>	-	-	-	-	tithēsi	tithēti
<i>t</i> → ∅ / — #	-	phérei	-	phérēi	-	-
<i>Frication</i>	-	-	-	-	-	tithēsi
<i>i</i> → ∅	-	-	-	-	tithēs	-

	<u>THEMATIC VERBS</u>		<u>ATHEMATIC VERBS</u>			
<u>Traditional solution</u>	Indicative	Subjunctive				
	<u>AEOLIC</u>					
	*phéresi	*phéreti	*phérēsi	*phérēti	*títḥēsi	*títḥēti
<i>Metathesis (a)</i>	phéreis	phéreit	-	-	-	-
<i>t → ∅ / - #</i>	-	phérei	-	-	-	-
<i>Frication</i>	-	-	-	phérēsi	-	títḥēsi
<i>(homonymic clash)</i>	-	-	-	phérēs	-	títḥēs
<i>-i → ∅</i>	-	-	phérēs (undoc)	-	títḥēs	-
<i>(homonymic clash)</i>	-	-	-	phérē	-	títḥē
	<u>HOMERIC</u>					
<i>Metathesis (a)</i>	phéreis	phéreit	phérēis			
<i>Metathesis (b)</i>	-	-	-	phérēiti		
<i>t → ∅ / - #</i>	-	phérei	-	-		
<i>(analogical extension of thematic endings)</i>	-	-	-	phérēisi		
	<u>ATTIC</u>				títḥeis	títḥei
<i>Metathesis (a)</i>	phéreis	phéreit	phérēis	phérēit	-	-
<i>t → ∅ / - #</i>	-	phérei	-	phérēi	-	-
<i>Frication</i>	-	-	-	-	-	títḥēsi
<i>(homonymic clash)</i>	-	-	-	-	títḥēs	-

Sg 1 πόημι

2 πόεις and πόηθα (with the ending of the Perfect, cf. οἴσθα < **woið-tʰa*).

3 πόει

This is supported by evidence from literary and inscrip-
tional Lesbian.²

Aeolic athematic forms are quite divergent from thematic forms of West Greek and Attic-Ionic dialects. Compare Lesbian and Attic:

Present of Contract Verbs

	3rd Sg	3rd Pl
<u>Ionic</u> (Attic)	φιλεῖ τιμᾷ στεφανοῦ	φιλοῦσι τιμῶσι στεφανοῦσι
<u>Aeolic</u> (Lesbian)	φίλει τιμαί στεφάνου	φίλεισι τιμαίσι στεφάνοισι

The main difference between Ionic and Aeolic forms consists in the location of accent. In Attic, the circumflex on the ultimate or penultimate is a result of contraction of the stem-vowel and the thematic vowel (*philé+ei* → *philēi*, *philé+onti* → *philōsi*). In Aeolic, the thematic vowel is syncope and the accent is located on the syllable which precedes the syllable containing the stem-vowel (*phíle+(o)nti*).

There are basically two ways to reduce Ionic and Aeolic forms to a common proto-form:

- a) if **philéonti*, with the accent on the antepenultimate, is chosen, then there must be a metatony (leftward shift of accent) accompanied by the syncope of the thematic vowel in Aeolic:

	<u>Ionic</u>	<u>Aeolic</u>
	philéonti	philéonti
Metatony + Syncope	-	phílenti

- b) if **phíleonti* is chosen, then there must be a different type of metatony (rightward shift of accent) in Ionic and the syncope of the thematic vowel in Aeolic. The accent in this case belongs to the PIE ancestor of Greek and the metatony is nothing other than the Greek general limiting rule.

Note that in Aeolic the diphthongs *ei*, *oi*, *ai* result not only from metathesis in the environment before a cluster *-ns-* followed by *-i*, but also before a word final *-ns* (**nts*),

where metathesis is out of question (e.g. Pres Participle $\phi\lambda\epsilon\upsilon\varsigma < *ph\acute{\iota}lents$).³

3rd Sg PRESENT OF CONTRACT VERBS

$\phi\upsilon\lambda\acute{\epsilon}\epsilon\iota$ $\tau\tau\acute{\upsilon}\mu\acute{\alpha}\epsilon\iota$ $\sigma\tau\epsilon\phi\alpha\nu\acute{\omicron}\epsilon\iota$

	<u>Ionic Attic</u>	<u>Aeolic (Lesbian)</u>
	$ph\acute{\iota}leei$	$ph\acute{\iota}leei$
Metatony	$phil\acute{e}ei$	-
Syncope	-	$ph\acute{\iota}lei$
Contraction	$phil\acute{\epsilon}i$	-
Monophthongization	$phil\acute{\epsilon}$	-
	$t\acute{\iota}maei$	$t\acute{\iota}maei$
Metatony	$t\acute{\iota}m\acute{a}ei$	-
Syncope	-	$t\acute{\iota}mai$
Contraction	$t\acute{\iota}m\acute{\alpha}i$	-
	$steph\acute{\alpha}noei$	$steph\acute{\alpha}noei$
Metatony	$stephan\acute{o}ei$	-
Syncope	-	$steph\acute{\alpha}noi$
Contraction	$stephan\acute{o}i$	-

3rd Pl PRESENT OF CONTRACT VERBS

$\phi\upsilon\lambda\acute{\epsilon}\nu\tau\iota$ $\delta\upsilon\phi\acute{\alpha}\nu\tau\iota$ $\sigma\tau\epsilon\phi\alpha\nu\acute{\omicron}\nu\tau\iota$

	<u>Ionic (Attic)</u>	<u>Aeolic (Lesbian)</u>
	$ph\acute{\iota}leonti$	$ph\acute{\iota}leonti$
Metatony	$phil\acute{e}onti$	$ph\acute{\iota}lenti$
Affrication	$phil\acute{e}ontsi$	$ph\acute{\iota}lentsi$
$t \rightarrow \emptyset / C - C$	$phil\acute{e}onsi$	$ph\acute{\iota}lensi$ <u>Arcadian</u>
	$phil\acute{\epsilon}ontsi$ <i>Metathesis</i>	$ph\acute{\iota}leinsi$
$n \rightarrow \emptyset$	$phil\acute{\epsilon}ontsi$	$ph\acute{\iota}leinsi$
+ Compensating		
Lengthening		
Raising	$phil\acute{\epsilon}ontsi$	
Contraction	$phil\acute{o}ntsi$	
	$d\acute{\iota}ps\acute{\alpha}onti$	$d\acute{\iota}psaonti$
Metatony	$d\acute{\iota}ps\acute{\alpha}onti$	$d\acute{\iota}psanti$
Affrication	$d\acute{\iota}ps\acute{\alpha}ontsi$	$d\acute{\iota}psantsi$
$t \rightarrow \emptyset / C - C$	$d\acute{\iota}ps\acute{\alpha}onsi$	$d\acute{\iota}psansi$
	$d\acute{\iota}ps\acute{\alpha}ontsi$ <i>Metathesis</i>	$d\acute{\iota}psainsi$
$n \rightarrow \emptyset$	$d\acute{\iota}ps\acute{\alpha}ontsi$	$d\acute{\iota}psaisi$
+ Compensatory		
Lengthening		
Raising	$d\acute{\iota}ps\acute{\alpha}ontsi$	
Contraction	$d\acute{\iota}ps\acute{o}ntsi$	

	stephánoonti	stephánoonti
Metatony	stephánoonti <i>Syncope</i>	stephánoonti
Affrication	stephánoont ^s i	stephánoont ^s i
$t \rightarrow \emptyset / C - C$	stephánoinsi	stephánoinsi <u>Arcadian</u>
	<i>Metathesis</i>	stephánoinsi
$n \rightarrow \emptyset$	stepháno ^s i	$n \rightarrow \emptyset$ stephánoisi
+ Compensatory		
Lengthening		
Raising	stepháno ^o si	
Contraction	stepháno ^o si	

The Subjunctive of contract verbs in Attic is largely identical with the Indicative (*tīmāēi* → *tīmāi*, *stephánoēi* → *stephánoī*, yet *philēēi* → *philēi* versus indicative *philēei* *philēē*). It is most unfortunate that we do not know anything about the subjunctive of contract verbs in the Aeolic dialects (or in Arcado-Cypriot), but we may hypothesize that the syncope of the first component of the diphthong /ēi/ could take place as well:

$$\check{e} \rightarrow \emptyset / \left\{ \begin{matrix} e \\ a \\ o \end{matrix} \right\} - i$$

Further complications emerge in the analysis of the Present Participle of contract verbs since there are at least six different forms in dialects:

φύλεντι	Lesbian
φύλέντι	Arcadian, Thessalian (Pelasgiotis)
φύλευντι	Ionic, Doric (East Aegean, Megara)
φύλουντι	Attic
φύλιοντι	Boeotian, Cypriot, 'Strict' Doric (Cretan, Laconian, Heraclea)
φύλέοντι	Thessalian (Thessaliotis) ⁴

Deriving all these forms from **phileonti*, we can say that Lesbian kept the pre-Greek accent but syncopated the thematic vowel; Arcadian and Thessalian (Pelasgiotis) shifted the accent rightward and syncopated the thematic vowel; Attic shifted the accent rightward and contracted the stem-vowel and thematic vowel; finally, the sequence /e+o/ could remain unchanged as in Thessaliotic, or undergo progressive or regressive height dissimilation:

/eo/ → /eu/ (Progressive) in Ionic, Doric (East Aegean, Megara)
 /eo/ → /io/ (Regressive) in Boeotian, Cypriot, 'Strict' Doric

All these forms could have developed as shown below:

PRESENT PARTICIPLE OF CONTRACT VERBS

φιλῆων

(Dat Sg φιλῆοντι)

	<u>Arcadian</u>		
	<u>Thessalian</u>		<u>Lesbian</u>
	(Pelasgiotis)		
	ph ^h ileonti		ph ^h ileonti
Metatony	philéonti		-
Syncopation	philénti		ph ^h ilénti
	<u>Ionic</u>		<u>Boeotian</u>
	<u>Doric</u> (East		<u>Cypriot</u>
	Aegean,		
	Megara)		
			<u>'Strict' Doric</u>
			(Cretan,
			Laconian,
			Heraclea)
	ph ^h ileonti		ph ^h ileonti
Metatony	philéonti		philéonti
Progressive	philéonti	Regressive	philíonti
Height		Height	
Dissimilation		Dissimilation	
	<u>Attic</u>		
	ph ^h ileonti		
Metatony	philéonti		
Contraction	philōnti		
Raising	philōnti		

We may tabulate all these forms (and also plural forms of the Participle) in Figure 5-1 to show their dialectal distribution.

The location of the accent is uncertain in the case of athematic verb in Doric and particularly in the case of athematic and contract verbs in Arcadian. In Arcadian the accent could be situated on the antepenultimate as in Aeolic, or on the penultimate as in Ionic:

<u>Lesbian</u>		<u>Arcadian</u>		<u>Ionic</u>
φῦλεντι		φῦλεντι or φιλέντι		φιλῆοντι
*φῦλενσι (→ φιλέντεσσι)		φῦλενσι	φιλένσι	φιλῆουσι
φῦλεσι (<* φῦλενσι)		φῦλενσι	φιλένσι	φιλῆουσι

In terms of process analysis, both sets of Arcadian forms can be derived in the same way; however, the forms with accent located on the antepenultimate do not undergo metatony as in Aeolic (cf. the derivation of contract verbs in Ionic with metatony and in Aeolic without metatony):

Figure 5-1. The dialect geography of thematic, athematic and contract verbs

	<u>Part Pres</u> (Dat Sg)	<u>Part Pres</u> (Dat Pl)	<u>Pres Indic</u> (3rd Pl)
<u>Aeolic</u> (Lesbian)	φέρωντι τιθέεντι φύλεντι	φερόντεσσι τιθέεντεσσι φύλέντεσσι	φέρουσι τίθεισι φύλεισι
<u>Attic</u>	φέρωντι τιθέεντι φιλοῦντι	φέρουσι τιθεῖσι φιλοῦσι	φέρουσι τιθέασι φιλοῦσι
<u>Ionic</u> <u>Doric</u> ('Strict')	φέρωντι (also East Aegean)	φέρωνσι (φερόντοισι in North-West)	τιθεῖσι
	τιθέεντι	τιθέουσι	τίθεντι
	φιλῶντι	φιλῶνσι (φιλεόντοισι in North-West)	φιλῶντι
<u>Arcadian</u>	φέρωντι	φέρωνσι	φέρωνσι
	τίθεντι	τίθενσι	τίθενσι
	φύλεντι	φύλենσι	φύλενσι

<u>Arcadian</u>			
	<u>Part Pres</u> (Dat Sg)	<u>Part Pres</u> (Dat Pl)	<u>Pres Indc</u> (3rd Pl)
<i>Metatony</i>	phíleonti	phíleontsi	phíleonti
<i>Syncope</i>	philéonti	philéontsi	philéonti
<i>Affrication</i>	philénti	philéntsi	philénti
$t \rightarrow \emptyset / C - C$	-	-	philéntsi
	-	philénsi	philénsi
	phíleonti	phíleontsi	phíleonti
<i>Metatony</i>	-	-	-
<i>Syncope</i>	phílenti	phílentsi	phílenti
<i>Affrication</i>	-	-	phílentzi
$t \rightarrow \emptyset / C - C$	-	phílensi	phílensi

5.3 ATHEMATIC VERBS 'BE', 'GO' AND 'SAY'

There are several different forms of εἶναι 'to be' in the Present:

	<u>Attic</u>	<u>Homeric</u>	<u>Aeolic</u>	<u>Doric</u>
Sg 1 εἶμι			ἔμμυ (Lesbian) ἔμμυ (Thessalian)	ἦμι
2 εἶ		εἶς, ἔσσυ		
Pl 3 εἶσιν		ἔασυ	εἶσιν (Lesbian) ἔννυ (Thessalian)	<u>West Greek</u> ἐντι

The 1st Sg is easy to explain. The Aeolic group underwent a regressive dissimilation of sibilant /s/, whereas elsewhere the sibilant was subjected to fricative weakening. If the accent of Thessalian ἔμμυ is genuine, then we can imagine the sequence of sound changes as follows:

		<u>Lesbian</u>	<u>Thessalian</u>
<i>Fricative</i>	esmi	ésmi	esmi
<i>Weakening</i>			
<i>Compensatory</i>	ehmi	ézwi	ezmi
<i>Lengthening</i>			
<i>Raising</i>	ēmi	émmi	emmi
	ēmi <u>Doric</u>		
	ēmi <u>Attic-</u>		
	<u>Ionic</u>		

The 2nd Sg εἶ 'you are' is from Proto-Greek *éssi (→ ési → éhi → éi), but a problem is presented by Homeric εἶς. According to Schwyzler (1938:659), this form consists of εἶ + s, with -s extended analogically from the other forms of the 2nd Sg. Schwyzler explains εἶς 'you will go' (in Hesiod WD 208) in exactly the same way. Yet this assumption is unnecessary, since the first form can be derived by metathesis (a) and, in

the second case, the loss of final *-i* from the primary ending **-si* seems to be more likely:

	éssi	éssi		
<i>Degemination</i>	ési	ési	éisi	éisi
<i>Metathesis (a)</i>	-	éis	-	-
<i>Fricative Weakening</i>	éhi	-	éihi	-
<i>h</i> → ∅ / V - V	éi	-	éii	-
<i>-i</i> → ∅			éi	éis
	ελ	ελς	ελ	ελς

The expected form of the 3rd Pl is *ελού in Attic-Ionic, *ἐντ in West Greek (and *ελου could be predicted for Aeolic after 'psilosis'), all these going back to Proto-Greek **senti*. On the other hand, the Mycenaean form /e(h)ensi/, spelled *e-e-si*, suggests Proto-Greek **esenti*, with the full grade **es* generalized throughout the whole paradigm:

	esénti	sénti	
<i>Fricative Weakening</i>	ehénti	hénti	
			or
<i>Affrication</i>	ehéntsi	héntsi	
<i>t</i> → ∅	ehénsi	hénsi	hénsi
<i>h</i> → ∅ / V-V	eénsi	hénsi	hénsi
	<i>Metathesis (b)</i>	<i>Comp. Length.</i>	
	n → ∅	heínsi	hêsi
		<i>Raising</i>	hêsi

The expected form would be quite inconvenient since it would be almost homonymous (only the accent is different) with the expected form of 'they will go' (from **jénti*). Furthermore, there is another form ελου, belonging to the Aorist Participle (Dat Pl) of ἔημι 'send'. Since languages usually do not tolerate homonymy involving the most frequent verbs 'be' and 'go', both forms were replaced by more distinctive formations:

ἔημι	ἵέναι	εἵναι
*jént+si	j+énti	*s+énti
⋮	⋮	⋮
ελου	ελου	ελού
	replaced by	replaced by
	ἔασαι	εἰσά

'having sent' (Dat Pl) 'they will go' 'they are'

The inflection of the verb ἵέναι 'to go' in the Present Indicative is remarkably close to the corresponding inflection in PIE (some forms are identical). The desinential accent in the 1st and 2nd Pl is preserved only in Vedic, and Greek regularized the initial accent in all forms:

	Vedic	PIE	Greek
Sg 1	émi	*éimi	εἰμι
2	éṣi	*éisi	εἶ, εἶς (Hesiod), εἶσθα (Homeric)
3	éti	*éiti	εἶσι, εἵτε (Cyrenaean)
Pl 1	imās	*imés/n	ἔμεν
2	ithā	*ité	ἔτε
3	yānti	*jénti	ἔασι

The situation in the 2nd Sg is an interesting one. Here we may assume that *-s-* of the ending **-si* underwent a fricative weakening in Attic; on the other hand, *-s-* was not obliterated in the forms preserved in Hesiod and Homer:

<i>Fricative Weakening</i>	éisi	éisi
<i>h</i> → ∅ / V - V	éihi	-
<i>-i</i> → ∅	éii	-
	éi	éis (+ t ^h a)
	εἶ (Attic)	εἶς (Hesiod)
		εἶσθα (Homeric)

The form of the 3rd Pl ἔασι 'they will go', occurring in Homeric and Attic, is a new formation for the expected ἔεισι or εἶσι. The ending *-asi* is borrowed from the Perfect (λελοῖπ + ασι). The same phenomenon occurred in athematic verbs: τιθέασι (instead of τιθεῖσι, which occurs in Aeolic; this form is from **tithenti*, which is preserved by Doric τιθεντι). The PIE ending of the 3rd Pl **-enti* has been replaced everywhere in Attic-Ionic, with the exception of the verb 'to be', εἰσὶ 'they are' (cf. Doric ἐντι). In the case of 'they will go', the sequence of changes could have been the form **jénti* → *hénti* → *héntsi* → *hénsi* → *hêsi* or *hêinsi* → *héisi*, the reason for the innovation being the indistinctiveness of **hêsi*.

We may hypothesize that in Aeolic εἶσι could be not only singular 'he will go' but also plural 'they will go':

	éiti	jénti
<i>j</i> → <i>h</i>	-	hénti
<i>Psilosis</i>	-	énti
<i>Affrication</i>	éitsi	éntsi
<i>t</i> → ∅	éisi	énsi
<i>Metathesis (b)</i>	-	éinsi
<i>n</i> → ∅	-	éisi

In exactly the same way we may derive Aeolic φαῖσι 'he says' < **phaiti* and homophonous φαῖσι 'they say' < **phanti*. Another piece of indirect evidence for this reconstruction is supplied by Lesbian (Sappho) ἔεισι 'they send', from Proto-Greek **jénti*, versus Attic ἔασι:

	<u>Proto-Greek</u>	<u>Attic</u>	<u>Aeolic</u>
'they send'	*jīenti	ἰᾶσσι	ἴελσσι
'they will go'	*jēnti	ἰᾶσσι	x = εἴσσι

Of course, even x = ἴελσσι is possible (with *-i* analogically with ἴμεν, ἴτε). A result of various sound-changes from Proto-Greek to classical dialects was the undesirable indistinctiveness of certain forms in both Ionic and Aeolic. As pointed out above, this can be considered a main reason why some of these forms were replaced by new, more distinctive formations:

	<u>Proto-Greek</u>	<u>Attic</u>	<u>Aeolic</u>
'they are'	*sentí	εἰσσί	εἰσσί
'he will go'	*éiti	εἴσσι	εἴσσι
'they will go'	*jēnti	(ἰᾶσσι) new form	εἴσσι
'they send'	*jīenti	(ἰᾶσσι) new form	ἴελσσι

We may hypothesize that the accent in Aeolic εἰσσί 'they are' was located on the last syllable, even if this breaches the Aeolic rule of recession of accent, since otherwise εἴσσι would be semantically overloaded.

A large variety of forms exists in the Imperfect of εἶναι 'to be':

	<u>Lesbian</u>	<u>Homeric</u>	<u>Attic</u>	<u>West Greek</u> <u>Aeolic</u> <u>Arcado-Cypriot</u>
Sg 1	ἔον	ῥα	ῥ (Old Attic), ῥν	
2	ῥσθα	ῥσθα	ῥσθα	
3	ῥς	ῥεν, ῥην	ῥν	ῥς
Pl 1		ῥμεν	ῥμεν	
2		ῥτε	ῥστε, ῥτε	<u>West Greek</u>
3	ἔον ῥσαν	ἔσαν	ῥσαν	ῥν

Historically, this variety is explainable by the assumption that Proto-Greek could form the Present, Imperfect and Perfect from the same PIE root **es* as did Vedic (1 Sg Impf *ásam* - 1 Sg Perf *ása*, 2 Sg Impf *ásīs* - 2 Sg Perf *ásitha* etc.). Later on, however, the Perfect Paradigm was given up and there are only a few forms surviving in the Homeric dialect. The dissolution of the Proto-Greek system can be imagined as shown below:

<u>Homeric</u>	<u>Proto-Greek</u>	<u>Attic-Ionic</u>	<u>West Greek</u>
	Perfect	Imperfect	
ῥα	*é-s-a	*é-s-η → ῥ	
ῥσθα	*é-s-t ^h a	*é-s-s	
	*é-s-a	*é-s-t → ῥς	

* <i>ēs</i> -men	ἤμεν
* <i>ēs</i> -te	ἥστε
* <i>ēs</i> -ent	

As is well-known, PIE knew another *verbum existentiae* formed from the root **bhū*. Vedic shows nicely that all forms from the root **es* could be paralleled by forms from the root **bhū*. In the development of various IE languages this situation presented a choice in the formation of paradigms - thus Latin used the root **bhū* in the Perfect, whereas Old Church Slavonic used the same root in both Imperfect and Aorist. In Greek, the suppletive form replacing the old Perfect is taken from γίγνομαι 'be born, be produced, take place' (with a basic meaning 'to come into being').

	<u>Present</u>	<u>Imperfect</u>	<u>Perfect</u>
<u>Vedic</u>	ásmi	ásam	ása
	bhávāmi	ábhavam	babhūva ábhuvam (Aorist)
<u>Proto-Greek</u>	* <i>ésmi</i>	* <i>ēs</i> η	* <i>ésa</i>
<u>Attic</u>	εἰμὶ	ἥ(ν)	γέγονα ἐγενόμην (Aorist)
<u>Latin</u>	sum	eram	fuī
<u>Old Church Slavonic</u>	jesmь	bjeaxь	bjexь (Aorist) byxь (Aorist)

The 3rd Sg Impf ἥς in West Greek, Aeolic and Arcado-Cypriot goes back to Proto-Greek Imperfect **ēs-t* (with loss of word-final *-t*). On the other hand, Homeric ἤεν (and Attic-Ionic ἥν) is an odd form. Schwyzler (1938:677) suggests that this form represents the PIE plural form **ēs-ent* (cf. Vedic *āsan*); this assumption seems to be unwarranted since it is based on a rather superficial resemblance. It could be that this form goes back to **ē-se(n)* plus an Aorist ending, which was introduced in the plural ἥσαν:

ἤεν	ē-se(n)	cf.	ἔλυ -σε(ν)
ἥσαν	ē-san		ἔλυ -σαν

The trouble with this hypothesis is that ἥσαν is a recent (?) formation, whereas ἤεν might be old. The problem is connected with the change *s* → *h* (fricative weakening) with subsequent loss of intervocalic /h/. It can be argued that Greek lost /s/ in the Imperfect formed from the root **es*. As shown by the 2nd Pl forms ἥστε ~ ἥτε two synchronic analyses presented themselves to speakers of Greek - with or

without /s/. The second 'etymological' analysis would of course be supported by the Present forms:

	<u>Imperfect</u>		<u>Present</u>
Sg 2	$\hat{e}$ - stha	or	$\hat{e}s$ -t ^h a
Pl 1	$\hat{e}$ - men		es - mén
2	$\hat{e}$ - te		$\hat{e}s$ - te es - té
3	$\hat{e}$ - san		$\hat{e}s$ - an

The first analysis with /s/ synchronically irrecoverable comes into play also for some Homeric Present forms (Pl 1 εἰμέν versus Attic ἐσμέν):

	<u>Present</u>	
Sg 1	ei - mí	or
2	ei - s	es - sí
3		es - tí
Pl 1	ei - mén	
3	ei - sín	

The situation for the Imperfect of ἵεναι 'go' parallels that for εἶναι 'be', in collapsing Proto-Greek Imperfect and Perfect forms:

	<u>Ionic</u>	<u>Homeric</u>	<u>Attic</u>
Sg 1	ἦλον	ἦλα	ἦα
2			ἦεις, ἦελσθα
3	ἦλε, ἦλε		ἦελ
Pl 1	ἦλομεν		ἦμεν
2			ἦτε
3	ἦλον	ἦσαν, ἦσαν	ἦσαν

The reconstruction of these forms for Proto-Greek is difficult, but we can imagine a state of affairs similar to that of Vedic, which still shows a distinct morphology of Imperfect and Perfect formed from the same root **ei* (Impf *āyam*, *āis* ... versus Perf *iyāya*, *iyátha*). Homeric ἦλα (and Attic ἦα) continue the Proto-Greek Perfect **ēi+a* (but even the Proto-Greek Imperfect **ēi+m* would give the same result). The Proto-Greek 2nd Sg Perfect could be reconstructed as **ēi+th^a*; the forms actually documented show that the original ending **-th^a* was replaced by *-eis*, which superficially looks as if it were taken from the thematic Present, but is probably the same *-eis* (and *-ei* in the 3rd Sg) which is typical of the Pluperfect: ἐλελούπ+εις (and ἐλελούπ+ελ). Another form of the 2nd Sg occurring in Attic has the ending **-th^a* suffixed to *ēiteis* in the same way as in the Present:

'you will go'

ei

ei + s

ei + s + t^h_a

'you went'

ēi + eis

ēi + eis + t^h_a

As shown by Ionic, the Imperfect of ἔλναι could also be inflected in a completely 'regular' way as a thematic Imperfect.

Equally diversified are the Present forms of the verb φάναλ 'to say':

	<u>Attic</u>	<u>Homeric</u>	<u>Lesbian</u>	<u>Doric</u>
Sg 1	φημῖ		φαῖμυ	
2	φῆς	φῆλς, φῆλσθα	φαλ, φαῖσθα	
3	φησῖ		φαῖσι	
Pl 1	φάμεν			
2	φατέ			
3	φασῖ		φαῖσι	φαντι

The difference between Ionic (Attic) and Aeolic (Lesbian) is due to the fact that metathesis (b) took place in Lesbian, while Attic underwent the usual loss of nasal and compensatory lengthening in the 3rd Pl, and fronting and raising in the 3rd Sg:

	<u>Lesbian</u>	
	3rd Sg	3rd Pl
	pháti	phánti
<i>Affrication</i>	phát ^s i	phánt ^s i
<i>t</i> → ∅	phá ^s i	phánsi
<i>Metathesis (b)</i>	pháisi	pháinsi
<i>n</i> → ∅	-	pháisi

	<u>Attic</u>	
	3rd Sg	3rd Pl
	phāti	phantí
<i>Affrication</i>	phat ^s i	phant ^s í
<i>t</i> → ∅	phásí	phansí
<i>Fronting</i>	phǣsí	-
<i>Raising</i>	phēsí	-
<i>n</i> → ∅		phāsí
<i>+ Compensatory Lengthening</i>		

The 2nd Sg is more complicated. We must postulate

metathesis (a) to explain Homeric φῆις, φῆισθα, Lesbian (Sappho) φαῖσθα, and metathesis (b) to explain Lesbian (Alcaeus) φαῖ; furthermore, in the case of φαῖ, we must assume that fricative weakening obliterated the -s- of the ending *-sī.

	<u>Attic</u>		<u>Homeric</u>
	p ^h ási		p ^h ási
-i → ∅	p ^h ás	<i>Metathesis (a)</i>	p ^h áis
<i>Fronting</i>	p ^h æs		p ^h æis
<i>Raising</i>	p ^h ēs		p ^h ēis (+th _a)
	<u>Lesbian</u>		
	p ^h ási		p ^h ási
<i>Metathesis (b)</i>	p ^h áisi	<i>Metathesis (a)</i>	p ^h áis
<i>Osthoff's Law</i>	p ^h áisi		p ^h áis (+th _a)
<i>Fricative Weakening</i>	p ^h áihi		
h → ∅ / V - V	p ^h áii		
-i → ∅	p ^h ái		

5.4 PERFECT WITH ASPIRATE

Perfect with aspirate appears in the 5th c. in Attic and Ionic dialects. Only stems in a labial or velar obstruent display this formation: stems in /p/, /b/ and /p^h/ have Perfect in /p^h/, and stems in /k/, /g/ and /k^h/ have Perfect in /k^h/, e.g. κρύπτω 'hide', κέκρυφα, φυλάττω 'guard', πεφύλαχα.⁵ In the Homeric dialect there are forms of the 3rd Pers Pl Middle Voice Perfect where we find the aspirates /p^h/ and /k^h/ in exactly the same environment, e.g. τετράφαται (from τρέπω 'turn'), τετάχαται (from τάττω 'arrange'). Various hypotheses have been elaborated to explain these facts. Thus according to Meillet (in Schwyzler (1938:772)), the aspiration in all these forms is a result of an analogical extension from the roots where it was etymological. In ἔσκαφα (from σκάπτω 'dig') the aspiration is etymological (cf. σκάφη 'the hull of a ship', σκάπτω < *skaphjō), whereas in βέβλαφα (from βλάπτω 'disable') the aspiration is unetymological (cf. βλάβη 'harm', βλάπτω < *blabjō). According to Schwyzler (1938:771), the aspiration in the 3rd Pl Middle τετράφαται originated in forms with clusters φθ and χθ (e.g. 3rd Sg Imper τετράφθω, Infinitive τετράφθαι with the accent located on the same syllable), and the aspiration was extended from such cases to all persons of the active Perfect, starting with the 3rd Pl.

Both hypotheses apparently lack any deeper and more cogent reasons. Schwyzler's explanation, in particular, seems to be unsatisfactory.

A more plausible explanation has been elaborated by Christol (1972:69), according to whom φ and χ are to be analyzed as archiphonemes /p/ and /k/ plus a suffix /h/, which functioned as a marker of the active Perfect. Thus the similarity between the structure of the Perfect and Aorist becomes obvious in the case of the verb $\sigma\kappa\acute{\alpha}\pi\tau\omega$, where reduplication is impossible and the only difference between the Perfect and Aorist is the difference between markers:

	<u>Perfect</u>	<u>Aorist</u>
Sg 1	éskap+h+a	éskap+s+a
Pl 1	eskáp+h+amen	eskáp+s+amen

A Perfect marker $-h-$, whatever its origin, was undoubtedly quite inconvenient for a language with aspirate phonemes /p^h/, /t^h/ and /k^h/, since the sequence of two phonemes /p+h/ could be reanalyzed as a single phoneme /p^h/. Consequently, we may hypothesize that the historical stage of Greek with the Perfect marker $-h-$ was rather short and unstable. After the introduction of the new Perfect marker $-k-$, the old marker $-h-$, if it was ever used elsewhere than after the stems in labial and velar stops, was given up. The reason was that Greek also knew Perfects in which reduplication functioned as the external marker, and which showed ablaut in the stem, e.g. $\lambda\epsilon\acute{\iota}\pi\omega$ - $\lambda\acute{\epsilon}\lambda\omicron\upsilon\pi\alpha$ (not always, however, e.g. $\phi\epsilon\acute{\upsilon}\gamma\omega$ - $\pi\acute{\epsilon}\phi\epsilon\upsilon\gamma\alpha$). Consequently, two synchronic analyses of $\epsilon\sigma\kappa\alpha\phi\alpha$ were available:

$\lambda\acute{\epsilon}\lambda\upsilon + k + a$	$\pi\acute{\epsilon}\phi\phi\epsilon\upsilon\gamma + a$
$\acute{\epsilon}\sigma\kappa\alpha\phi + h + a$	$\acute{\epsilon}\sigma\kappa\alpha\phi^h + a$

These prehistoric stages can be reconstructed in the following sequence:

Stage 1 (a) Inherited PIE Aorist marker $-s-$

(b) Perfect marker $-h-$ (origin?)

<u>Aorist</u>	$\acute{\epsilon}\lambda\bar{u} + s + a$	$\acute{\epsilon}\sigma\kappa\alpha\phi + s + a$
<u>Perfect</u>	$\lambda\acute{\epsilon}\lambda\upsilon + h + a$	$\acute{\epsilon}\sigma\kappa\alpha\phi + h + a$

Stage 2 (a) Greek *fricative weakening*: $s \rightarrow h$ / $V - V$

(b) Greek Perfect Marker $-k-$

<u>Aorist</u>	$\acute{\epsilon}\lambda\bar{u} + h + a$	$\acute{\epsilon}\sigma\kappa\alpha\phi + s + a$
<u>Perfect</u>	$\lambda\acute{\epsilon}\lambda\upsilon + k + a$	$\acute{\epsilon}\sigma\kappa\alpha\phi + h + a$

Stage 3 (a) Aorist marker $-s-$ used even intervocalically (analogy with postconsonantal s)

<u>Aorist</u>	$\acute{\epsilon}\lambda\bar{u} + s + a$	$\acute{\epsilon}\sigma\kappa\alpha\phi + s + a$
<u>Perfect</u>	$\lambda\acute{\epsilon}\lambda\upsilon + k + a$	$\acute{\epsilon}\sigma\kappa\alpha\phi + h + a$

During Stage 2, there arose a certain ambiguity when *-h-* could be used as a marker of both Aorist (where intervocalical *-h-* represented underlying *-s-*) and Perfect (where *-h-* stood for underlying *-h-*). This situation might have provided an incentive for the Greek introduction of the new Perfect marker *-k-*. Of course, Greek relied on the reduplication in contrasting Perfect and Aorist, e.g. βέβλαφα vs. ἔβλαφα; consequently, the danger of homonymic clash would be limited only to cases where reduplication was not possible (in verbs like σκάπτω, ῥίπτω, ἄρχω, ἀνούγνυμι, etc.). All this discussion, however, remains purely speculative since we simply do not possess any direct evidence that the Aorist marker *-s-* (the same is true for Future) ever underwent fricative weakening. In other words, analogy with the postconsonantal Aorist marker *-C-s* could prevent the sound change *s* → *h* / *V - V* from happening. As far as our data reach, there never was a stage in the history of Greek, when the Aorist marker *-s-* was obliterated by sound change as it was in Avestan or Old Church Slavonic.⁶

All this still does not explain the form of the 3rd Pl Middle Perfect in the Homeric and Ionic dialects τετράφαται. This rather inconvenient form (contrast stems in a vowel, such as λέλυνται, showing the characteristic 3rd Pl cluster *-nt-*, and stems in a consonant, such as **tetráphntai* → **tetráphatai* → τετράφαται without *-nt-*) was replaced in Attic by the analytic form τετραμμένοι εἰσύν. Christol hypothesizes that Homeric τετράφαται is a result of an extension of *h* from active forms (compared with Schwyzler's hypothesis this extension works in the opposite direction):

Christol (1972)

Perfect Active	Perfect Active	Perfect Middle
éskap + h + a	tétrop + h + a	tetráp + h + atai

Schwyzler (1938)

éskap ^h + a	tétroph ^h + a	tetraph ^h + thai tetraph ^h + atai
------------------------	--------------------------	--

A question to be asked is why Perfect with aspirate occurs only with stems in a labial or velar obstruent. If formed with stems in a dental obstruent, πείθω 'persuade' **pepeith^hntai*, we would predict forms like **pepeith^hatai* (with etymological aspirate). On the other hand, the extension of /h/ is impossible in the case of stems in the voiced dental obstruent /d/, κομίζω 'provide for' **kekomid^hntai*, where the form **kekomid^hatai* is predictable, but **kekomid^hatai* impossible; the reason is that Greek does not have voiced aspirates. Our documented forms, however, are invariably analytical ones: πεπεισμένοι εἰσύν, κεκομισμένοι εἰσύν.

The only relics of the prehistoric aspect marker *-h-* in Attic are preserved in the Perfect of stems in a labial or velar obstruent (the preservation of *-h-* was here conditioned by a certain inconvenience in pronouncing medial clusters *-p^(h) + k-* and *-k^(h) + k-*). It could be that there are other relics elsewhere in dialects, such as the forms of the 2nd Aorist athematic verbs (3rd Pl Active) found in various dialects:

<u>Boeotian</u>	ἀνεθεαν	versus	<u>Attic</u>	ἀνέθεσαν	<u>other dialects</u>
					ἀνεθεν
<u>Locrian</u>	ἀνεθεαν				
<u>Arcadian</u>	συνεθεαν				
<u>Cypriot</u>	κατεθεσαν				

In the singular there is a marker *-k-* which appears to have been borrowed from the Perfect εἶθι + κ + α. Plural forms have a short vowel in the stem with endings attached directly, e.g. εἶθε+μεν and εἶθε+τε. The 3rd Pl form in -αν might be a descendent of prehistoric **et^he+h+an*, where *-h-* was the old aspect marker used intervocalically. A further supporting reason for this hypothesis could be sought in the fact that the only difference between singular Aorist and Perfect forms of certain athematic verbs is reduplication:

<u>Aorist</u>	εἶθι + κ + α
<u>Perfect</u>	τέθι + κ + α

This parallels the situation in the prehistoric stages 1 and 2 before the introduction of the new Perfect marker *-k-*, where the only difference between Perfect and Aorist forms of all persons consisted of reduplication:

(Stage 2)	<u>Aorist</u>	*élū + h + a	levelled analogically into
			élū + s + a
(Stage 1)	<u>Perfect</u>	*lélū + h + a	later replaced by
			lélū + k + a

However, all this might be purely speculative, since the most likely origin of such forms as ἀνεθεαν was apparently the 3rd Pl of certain common verbs like εἶπαν 'they said' (also εἶπον) or ἤνεγκαν 'they carried' (also ἤνεγκον). The reason for the analogical extension could simply be the fact that the old form ἀνεθεν was not distinct enough, since it looked rather like a singular form - i.e., the motive was a maximization of morphological contrasts.

5.5 PERFECT PARTICIPLE

As stated traditionally, Aeolic dialects (Lesbian, Thes-salian and Boeotian) show thematic inflection of the Perfect Participle, Buck (1955:118). It is more appropriate to say

that Aeolic dialects have the marker *-ont-* in the Perfect Participle (whereas non-Aeolic dialects have the original marker *-óť-*) by analogy with the Present Participle.

Attic-Ionic

		<u>Present Participle</u>		<u>Perfect Participle</u>	
Masc Sg	N	λεῖπ	ων	γεγον	ώς
	G		οντ ος		ότ ος
	D		οντ ι		ότ ι
	A		οντ α		ότ α
Fem Sg	N		ουσ α		υς α

Aeolic

Masc Sg	N	λεῖπ	ων	γεγον	ων
	G		οντ ος		οντ ος
	D		οντ ι		οντ ι
	A		οντ α		οντ α
Fem Sg	N		ουσ α		ουσ α

Attic-Ionic shows two distinct patterns in the morphology of the Present and Perfect Participle:

Present Participle = ROOT ont CASE (root is accented)
 Perfect Participle = reduplication ROOT ót CASE (accent is located on the marker *-óť-*)

Speakers of Aeolic dialects no doubt found these patterns too complicated and simplified the whole matter by the analogical extension of the marker *-ont-* from the Present Participle to the Perfect Participle. The immediate incentive for this analogy was that Aeolic does not allow for the accent on the penultimate if the antepenultimate is accentable, i.e. Aeolic does not display the accentable morpheme *-óť-* functioning as the Perfect Participle marker elsewhere:

Present Participle = ROOT ont CASE
 Perfect Participle = reduplication ROOT ont CASE

The grammatical simplification lies in the fact that while the Perfect Participle is double-marked in Attic-Ionic (by reduplication and distinctive accent), it is marked only by reduplication in the Aeolic dialects. We may assume that the situation in Aeolic is secondary by hypothesizing that in this case the Attic-Ionic accent corresponds to the Proto-Greek accent. External evidence for this hypothesis is offered by Vedic, where the Perfect Participle is accented on the marker, e.g. *dad+ús+as* 'having given' (Gen Sg), but the Present Participle either on the root or on the inflection, e.g. *dád+at+as* 'giving' (Gen Sg) and *ad+at+ás* 'eating' (Gen Sg).

Consequently, we may reconstruct historical changes in Aeolic in terms of metatony and analogical extension as shown below:

<u>Proto-Greek</u>	<u>Aeolic</u>	
leíp+ont+os	leíp+ont+os	
gegón+wót+os	*gegón+wot+os	(metatony)
	gegón+ont+os	(analogical extension of -ont-)

The feminine form γεγονυῖα, especially, was exposed to various analogical extensions for quite obvious reasons. Its morphology was a sort of historical relic (notice the rare diphthong /ui/ limited to the environment before non-high vowels) and there are basically two types of analogical leveling of this cumbersome form in various dialects:

i) In Aeolic and North-West dialects (evidence from the late Delphian) the ending -ουσα or -ουσα was extended from the Present Participle:

	<u>Present Participle</u>	<u>Perfect Participle</u>
<u>Attic-Ionic</u>	λείπουσα	γεγονυῖα
<u>Aeolic</u> (Lesbian)	λείπουσα	τετόκουσα
<u>North-West</u> (late Delphian)	λειπουσα	δεδωκουσα

ii) In some Doric dialects (Theran, Heracleian), and also late Attic, the ending -εια was extended from the nominal *u-stems* (γλυκύς, Fem γλυκεῖα - the alteration *us : eia* goes back to the old ablaut pattern **us : *ewja* i.e. zero : full grade):

<u>Theran</u>	έστακεια	<u>Attic</u>	έστηκυῖα	(rare)
<u>Heracleian</u>	έρρηγεια		έρρωγυῖα	(theoretical)

In trying to avoid the analogical extension of -ont- into the Perfect Participle in terms of more abstract phonology, it would be a mistake to postulate a single underlying representation -wont- for both Present Participle -ont- and Perfect Participle *-wot-, which would generate both Attic-Ionic γεγονότος (**gegón+wót+os*) and Aeolic γεγόνοντος. The same reasoning could be pursued in the case of the feminine form, and a single underlying -wontja- could be reconstructed, which would generate both Attic-Ionic γεγονυῖα (*gegón+ús+ja* **gegón-wót+ja*) and Aeolic γεγόνουσα. Compare these two sets of underlying representations:

	<u>Abstract Phonology</u>		<u>Concrete Phonology</u>	
	<u>Present</u>	<u>Perfect</u>	<u>Present</u>	<u>Perfect</u>
Masc	ont	wónt	ont	wót
Fem	ontja	wóntja	ontja	wótja

One of the reasons why underlying representations like *wónt* and *wóntja* are to be rejected is that the evidence for them comes from two different dialects - Attic-Ionic γεγονυῖα enables us to postulate /w/ in underlying representations of the Perfect Participle, and Aeolic γεγόνοντος seems to indicate that a cluster /nt/ should figure in underlying representations of the same participle. In other words, a 'discovery procedure' applied in this case is nothing other than a cumulative method (used in Neogrammarian historical reconstructions or in generative phonology). This of course is not to deny that it is possible to derive even Aeolic γεγόνουσα from underlying *wóntja*. Another point against the assumption of such forms is that such an assumption necessitates a morphological rule whereby a cluster /nt/ is simplified to /t/ in the non-phonological environment of the Perfect Participle; notice that after this step one reaches the representations *wot*, *wotja* (p. 215).

It could be that some supporting evidence for the more abstract underlying representations *-wont-*, *-wóntja-* could come from the analysis of forms belonging to ἐστάναι 'stand';

<u>Attic</u>	ἐστῶς (Masc)	<u>Ionic</u>	ἐστεῶς (Masc)
	ἐστῶσα (Fem)		ἐστεῶσα (Fem)

These forms are traditionally analyzed as syncopated forms of ἑστηκα. Besides the participle forms there are only dual and plural forms of the Perfect and Pluperfect. They occur in Homer and Herodotos and in Attic Literature they are already archaisms.

ἐστ (ἦκ) αμεν	ἑσταμεν
ἐστ (ἦκ) ὤς	ἑστῶς

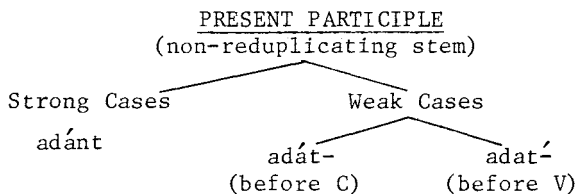
However, there is no *ἐστουῖα which would be syncopated from ἑστηκυῖα. Similarly, it is unnecessary to analyze Attic τεθνεῶς and Homeric τεθνηῶς as syncopated forms of τεθνηκῶς (both come from **tethnawos*) or Homeric τεθνηκυῖα (Od. 4.734) as syncopated form of τεθνηκυῖα (this form may be traced back to **tethnawosja* = zero-grade of *tethnawosja*). Thus the best we can do is to assume that the analogical extension of *-ont-* from the Present Participle could have already taken place very early in the pre-history of Greek. That analogical extension is still the most reasonable explanation may be supported by similar phenomena in the Perfect Participle of Vedic.

Vedic Present (and Future and Aorist) Participles have two stems: the strong in *-ant*, and the weak in *-at*, e.g. *adánt-* 'eating'. If the suffix is accented, the accent shifts in weak cases to the endings that begin with vowels. The participles of verbs with a reduplicating Present do not

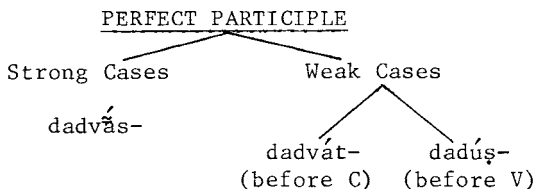
	<u>Attic-Ionic</u>			
	leípontos	leípontja	gegonwóntos	gegonwóntja
$nt \longrightarrow t$ / - <i>Perfect Participle</i>	-	-	gegonwótos	gegonwótja
$\emptyset$ - <i>Grade Formation</i>	-	-	-	gegonútja
$w \longrightarrow \emptyset$ / C -	-	-	gegonótos	-
<i>Affrication</i>	-	leípont ^s ja	-	gegonút ^s ja
t - <i>Loss</i>	-	leíponsja	-	gegonúsja
<i>Depalatalization</i>	-	leíponsa	-	gegonúhja
<i>Compensatory Lengthening</i>	-	leípōsa	-	gegonújja
<i>Raising</i>	-	leípōsa	-	-
			<i>Fricative Weakening</i> $h \longrightarrow j/-j$	

	<u>Aeolic</u>			
	leípontos	leípontja	gegonwontos	gegonwontja
$w \longrightarrow \emptyset$ / C -	-	-	gegonontos	gegonontja
<i>Affrication</i>	-	leípont ^s ja	-	gegonont ^s ja
t - <i>Loss</i>	-	leíponsja	-	gegononsja
<i>Metathesis</i>	-	leípoina	-	gegonoina
n - <i>Loss</i>	-	leípoisa	-	gegonoisia

distinguish a strong and weak stem, and keep *-at* (= weak stem) throughout, e.g. *dádat-* 'giving'.



The Perfect Participle, e.g. *dadvás* 'having given', shows three stems: the strong in *-vás* occurring in strong cases (Nom, Acc of Sg, Dual and Nom Pl) and two weak stems in *-vát* and *ús*. The first occurs before consonants, the second before vowels. The suffix of uncompounded forms is always accented. The stem in *-vát* represents an analogical extension of the stem *-át* from the Present Participle. The reason for this extension is quite simple. Proper phonological forms **dadvóbhis* (Instr Pl) and **dadvóbhyas* (Dat Pl), according to the rule *as* → *o* / - *bh*, would destroy paradigmatic unity in the sense that the characteristic marker of the Perfect Participle *vas* ~ *ús* would be obliterated. Thus instead of variants *vás* ~ *ús* ~ **vó* we find *vás* ~ *ús* ~ *vát*. Unfortunately, we do not have any documents for the Locative; we can reconstruct *dadvátsu* (cf. *patsú* 'feet' Loc.).



See the following chart (p. 217) for a more detailed description of the distribution of morphemic variants of both participles.

The same derivation in terms of more concrete phonology with two underlying representations *dadváns-* (generating *dadvás* and *dadús-as*) and *dadvót-*, which is extended analogically from *dádat-* (Present Participle) are presented below:

Solution (1)

	<i>dadvánsam</i>	<i>dadvánsas</i>
<i>Nasalization</i>	<i>dadvásam</i>	<i>dadvásas</i>
<i>Ø-Grade Formation</i>	-	<i>dadúsas</i>

Figure 5.2 Distribution of morphemic variants of Present and Perfect Participle in Vedic

PRESENT PARTICIPLE				PERFECT PARTICIPLE			
	(No reduplication)		(reduplication)				
Sg N	ad	án	dád at			dad	ván
A		ánt am	at am			vās	am
Pl N		ánt as	at as			vās	as
Sg I		ad at á	at ā			dad úṣ	ā
D		at é	at e			úṣ	e
Ab, G		at ás	at as			úṣ	as
L		at í	at i			úṣ	i
Pl A		at ás	at as			úṣ	as
I		ád bhis	ad bhis	ANALOGY	dad	vád bhis	
D, Ab		ád bhyas	ad bhyas			vád bhyas	
G		at ām	at ām			úṣ	ām
L		át su	at su			vát su	(undocumented)
<u>STEM</u>	strong	weak	weak		weak	weak	strong

<i>Retroflexion</i>	-	dadúṣas
<i>Solution (2)</i>		
	dadvánsam	dadvánsas
<i>Ø-Grade Formation</i>	-	dadúnsas
<i>Cluster Simplification</i>	-	dadúsas
<i>Nasalization</i>	dadvásam	-
<i>Retroflexion</i>	-	dadúṣas

However, even this derivation is probably beside the point since the matter may be further simplified if we assume that the nasal in *vās* (<*vāns*) is *analogically* extended from the Present Participle in *-ant*. As shown above on the chart, forms with nasal have the same distribution in both Present and Perfect Participle (Nom, Acc of Sg, Dual and Nom Pl), which could facilitate analogical extension. In other words, there is no point in deriving *uṣ* from VANS; *uṣ* should be derived from VAS and *vās* from VANS as shown below:

	dadvánsam	dadvánsas
<i>Ø-Grade Formation</i>	-	dadúsas
<i>Nasalization</i>	dadvásam	-
<i>Retroflexion</i>	-	dadúṣas

Summarizing, we may say that some forms of Perfect Participle in both Vedic and Greek are best explained as analogical extensions from the Present Participle:

<u>Present Participle</u>		<u>Perfect Participle</u>
analogy		
ant $\longrightarrow$	vant ~ vat ~ us	<u>Vedic</u>
ont $\longrightarrow$	(w)ont ~ (w)ot ~ us	<u>Greek</u>

NOTES

- 1 However, to do justice to the old hypothesis, it seems that even in Greek in some instances the personal ending *-(e)si* was really obliterated by fricative weakening and subsequent loss of intervocalic /h/. In this way, Attic *εἶ* 'you will go' (from **eisi*) and *εἰ* 'you are' (from **esi*) can be best explained:

	eisi	esi
<i>Fricative Weakening</i>	eihi	ehi
$h \longrightarrow \emptyset / V - V$	ei i	e i
$i \longrightarrow \emptyset$	ei	

2 See Thumb-Scherer (1959:102) for data:

Pres Sg 1	φύλημυ		
2	λύπης	and	φύλησθα
3	πούη	and	φύλει, τῆμαι, στεφάνου
Pl 1	φορήμεθα		
2			
3	ἐπυρρόμβεισι, δύψαισι, στεφάνουσι, διασάφηνται		

3 Compare the following forms:

<u>Aeolic (Lesbian)</u>			
3rd Pl Pres	φύλεισι	δύψαισι	στεφάνουσι
Participle Pres	φύλεις	γέλαις	δύδοις
<u>Attic-Ionic</u>			
3rd Pl Pres	εἰσὶ	φᾶσὶ	φέρουσι
Participle Pres	τιθεῖς	ἰστᾶς	διδούς
<u>Proto Greek</u>	*-enti	*-anti	*-onti
	*-ents	*-ants	*-onts

	<u>Aeolic</u>					
	enti		anti		onti	
<i>Affrication</i>	ent ^{Si}	ents	ant ^{Si}	ants	ont ^{Si}	onts
$t \longrightarrow \emptyset / C - C$	ensi	ens	ansi	ans	onsi	ons
<i>Metathesis (b)</i>	einsi		ainsi		oinsi	
$n \longrightarrow \emptyset$	eisi	eis(!)	aisi	ais(!)	oisi	ois(!)

	<u>Attic-Ionic</u>					
	enti		anti		onti	
<i>Affrication</i>	ent ^{Si}	ents	ant ^{Si}	ants	ont ^{Si}	onts
$t \longrightarrow \emptyset / C - C$	ensi	ens	ansi	ans	onsi	ons
$n \longrightarrow \emptyset$	ēsi	ēs	āsi	ās	ōsi	ōs
<i>+ Compensatory Lengthening</i>						
<i>Raising</i>	ēsi	ēs			ōsi	ōs

This difficulty would be removed if we assumed that Greek dialects went through a stage with nasalized vowels. The nasalized vowels could be diphthongized and later on denasalized yielding historical *-oisi* (Aeolic) or *-ousi* (Attic-Ionic):

	<u>Aeolic</u>	<u>Attic-Ionic</u>
	-onti	-onti
<i>Nasalization</i>	ōnti	ōnti
<i>Postnasal n</i> $\longrightarrow \emptyset$	ōti	ōti
<i>Diphthongization</i>	ōīti	ōūti
<i>Denasalization</i>	oiti	outi

	<u>Aeolic</u>	<u>Attic-Ionic</u>
<i>Affrication</i>	oit ^s i	out ^s i
<i>t</i> → ∅	oisi	ousi
	φέροισι	φέρουσιν
	-ants	-ants
<i>t</i> → ∅	ans	ans
<i>Nasalization</i>	āns	āns
<i>Postnasal n</i> → ∅	ās	ās
<i>Diphthongization</i>	āis	-
<i>Denasalization</i>	ais	ās
	παῦς	παῖς

- 4 See Thumb-Scherer (1959) and Thumb-Kieckers (1932) for the actually documented forms:

Arcadian ἐπιορκέντι 'swearing falsely' (Dat)

Cypriote ἰδ(ν)τα 'being' (Acc)

Thessalian (Pelasgiotis) στρατα]γέντος 'being general' (Gen)

(Thessaliotis) στραταγ] έο<λ>ντος
'being general' (Gen)

Boeotian ῥόντος 'running' (Gen)

Lesbian [ό]μονόεντες 'agreeing together' (Gen)

Cretan καλῶν 'calling'

Laconian ἀνιοχῶν (= ἡνιοχέων) 'holding the reins'

Heracleian ἀναγγελῶντι 'reporting' (Dat)

Ionic φιλεῦντας (Homeric) 'loving' (Acc Pl)

- 5 Some verbs had two Perfect forms - one in a stop, the other in an aspirate - and there usually was a difference in meaning. Forms in a stop were used intransitively, whereas later formations in an aspirate had transitive meaning:

ἀνέωγα 'I am open' vs. ἀνέωιχα 'I have opened'

πέπρωγα 'I am in a state...' πέπρωχα 'I have done'

ἔρρωγα 'I am broken' ἔρρηχα 'I have broken'

πέπηγα 'I am stuck' πέπηχα 'I have fixed'

- 6 The situation is quite complicated in Old Church Slavonic. Basically, the PIE Aorist marker is unchanged in the cluster -s-te (2nd Pl) and in underlying sequences of consonant + s. Elsewhere, s occurred subject to so-called Pedersen's Law (= 'ruki' rule), according to which PIE *s becomes a dorsovelar fricative x after i, u, r, and k. The resulting x is palatalized before front vowels. See the plural forms of the old sigmatic Aorist of *rešti* (**rek-ti*) 'say':

Pl 1	rěxomъ	<	*rēk-s-omu
2	rěste	<	*rēk-s-te
3	rěšě	<	*rēk-s-int

These forms can be derived in the following way:

	rēksomu	rēksint
<i>Pedersen's Law</i>	rēkxomu	rēkxint
<i>Cluster Simplification</i>	rēxomu	rēxint
<i>Palatalization</i>	-	rēšint
<i>Nasalization</i>	-	rēšē

However, *x* was extended analogically in many environments where it cannot be predicted as a result of Pedersen's Law, i.e. we may talk about the morphologization of the phonological process. See the Aorist forms of *pēti* (< **pen-ti*):

			<u>analogical formations</u>
Pl 1	pēsomъ	< *pen-s-omu	pēxomъ
2	pēste	< *pen-s-te	pēste
3	pēsē	< *pen-s-int	pēšē

See Leskien (1969:49, 145) for data.

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